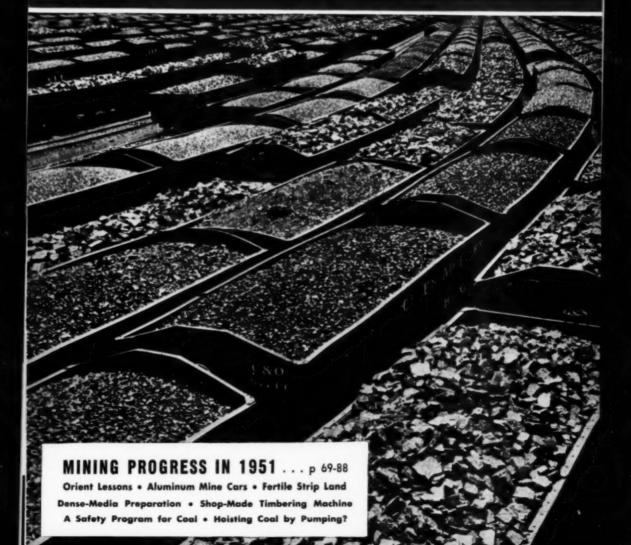
# Coal Age



# NO MINE CAN AFFORD TO LET REPAIRS HALT MAIN-LINE HAULAGE, SO...

MELVILLE No. 11 GOES

BACK TO MINE CARS!

After some years of experience with 'continuous' haulage systems, Hutchinson's Coal Company's Melville No. 11 has ordered 100 new Q.C. f. Drop Bottom Mine Cars for 5,000 feet of main-line haulage.

One advantage expected from this move is the virtual elimination of repairs that 'shut off' the mine's main flow of coal. With 'constant haulage' mine cars, the one car to be repaired is shunted off onto a siding, while the remainder of the cars keep hauling coal. Delays are almost always counted in minutes, rather than in hours or days.

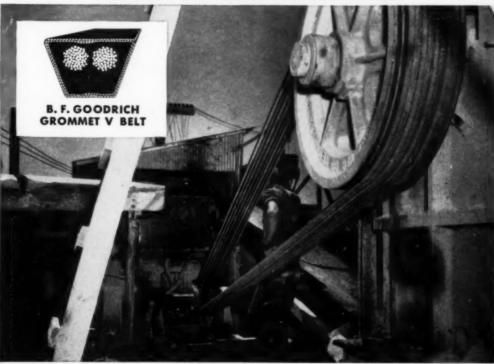
Hutchinson also expects Melville No. 11's new mine car system to provide safer, quicker transportation of men and materials, without the extra expense of a 'parallel' haulage system.

With the new four-ton cars, average dumping time for a 20-car trip is expected to be about 80 seconds. In many mines equipped with Q.C. f. Drop Bottom Mine Cars, this speed saves enough time for each trip to make several extra round trips a day.

Your nearby Q.C.f. Representative will help you analyze the advantages of constant haulage mine cars on your mine's main line. American Car and Foundry Company, New York • Chicago St. Louis • Cleveland • Washington • Philadelphia • San Francisco Huntington, W. Va. • Berwick, Pa.

Q.C.f. MINE CARS
for Constant Haulage

### RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER



### Production increased 25 per cent with B. F. Goodrich grommet V belts

### B. F. Goodrich often cuts belt costs 20 to 50 per cent

THESE belts drive a rock crusher 9 hours a day, six days a week. In addition to the long hours belts are exposed to dampness, oil and sharp grit. Still worse, the crusher abuses the drive with every impact of its jolting, grinding action. Previously, the operators had "tried everything" including flat belts, other V belts, even a chain drive. But mechanical trouble and production hold-ups continued.

The B. F. Goodrich grommet belts were tried at the suggestion of a BFG distributor's salesman. When the picture above was taken the grommet belts had been in operation almost 2 years. The grommet belts' record: production up 25%, large savings in labor and maintenance time, no belt replacement costs, better working conditions

for men-less noise, greater safety. BFG grommet belts can be counted on to save because of:

No cord ends-A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

Concentrated cord strength-All of the cord material in a B. F. Goodrich grommet multiple-V belt is concentrated in twin grommets, positioned close to the driving faces of the pulley. No layers of cords to rub against one other and generate heat; cord and adhesion failures are reduced.

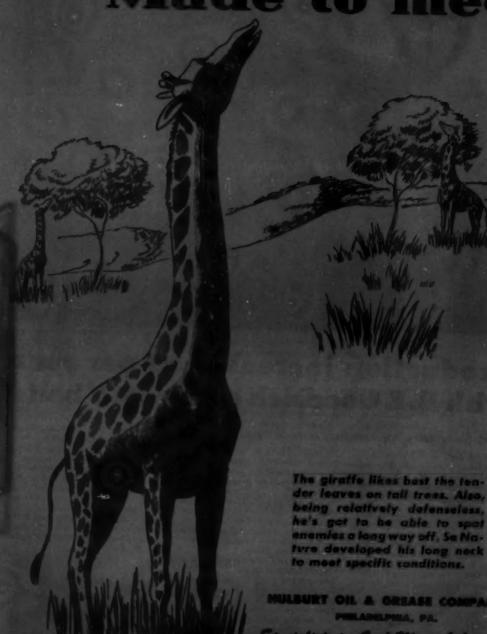
Better grip, less slip - Because a

grommet is endless, a grommet V belt is more flexible, grips the pulleys better. Size for size, grommet multiple-V belts will give 1/3 more gripping power, pull heavier loads with a higher safety factor.

Only B. F. Goodrich bas the grommet!- No other multiple-V belt is a grommet V belt (U.S. Patent No. 2,233,294). Now available in C, D and E sections. See your local B. F. Goodrich distributor. The B. F. Goodrich Company, Industrial & General Products Division, Akron, Obio.

B.F. Goodrich

# Successful because Made to meet

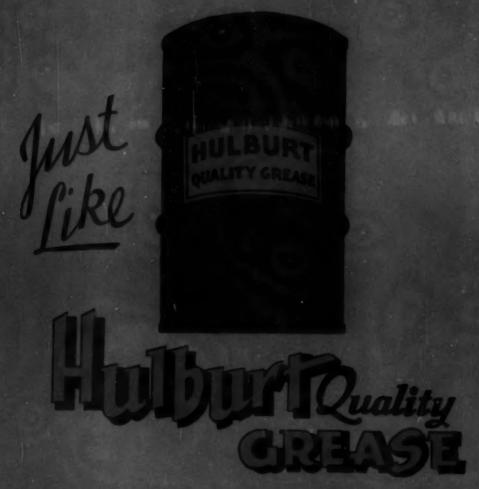


der leaves on tall trees. Also, being relatively defenseless, he's got to be able to spot enemies a long way off. Se Na-ture developed his long neck to meet specific conditions.

ILBURT OIL & GREASE COMPANY

in in Roal Wine Laboration

# specific conditions



Hulburt Quality Grease was developed to meet specific conditions, too. It's bianded for the one sale and specific purpose of successfully lubricating coal mining machinery. No "jack-of-all-trudes" grease can do this tough job right, any more than a general laborer can be a good coal minor. Hulburt does it, and does it supremaly well, because that's what it's made to do. That's why it pays to use Hulburt and not stick your neck out.

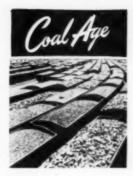
# The BIRD COAL FILTER does the G PERFORMANCE

is BIRD COAL FILTER does a big job of dewatering fit and—handling a ton or more a minute—getting it as d

does the so bulky

job that otherwise requires a bulky combination of expensive equipment, and does it at an operating cost (including power, labor, amortization) of five cents per ton maintenance cost less than two cents a ton!

Want more information? Get in fouch with SIRD MACHINE COMPANY SOUTH WALPOLE, MASSACHUSETTS



PERHAPS not all classification yards will be full of coal cars all the time in 1952, but all indications are that it will be a good year. This conclusion is more fully documented in the review and forecast which begins on p. 69. And when it comes to the mining plant to meet these increased demands with efficiency, quality and cost, 1951 progress, also reviewed in this issue, augurs well for 1952 and the future.

#### AHEAD IN COAL AGE

Addressed to the continuing problems of cost, quality and safety in coal mining, material scheduled for March and other early issues of Coal Age ranges from management on through to actual operations at the face and in the strip pits. Examples include:

Pitch Mining With a Continuous Machine—How one company has successfully applied a continuous unit to pitches up to 9 deg, with major cost savings.

Design for Modern Mechanized Operation—How one of the Nation's newer mines goes about development and operation for maximum efficiency with mechanized mining equipment. Stainless Steel for Low Maintenance—

Stainless Steel for Low Maintenance— Applications—more numerous than you think—and results in a modern preparation plant.

Reducing Roof-Fall Accidents—What standard timbering and advanced thinking can do in reducing injuries and fatalities from roof falls.

Fighting Fire With Flood—Methods and facilities employed at an anthracite colliery for fast, positive extinguishment of an underground fire.

Land Restoration—Another example of how a strip-mining company maintains efficiency and yet solidifies its position in the community by complete restoration of worked-over land.

COAL AGE FEBRUARY, 1952
VOLUME S7
(with which are combined The Colliery

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### FEBRUARY . 1952

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Washington



# ...when mine car wheels are lubricated with TEXACO OLYMPIAN GREASE

OR easier, power-saving starts—in cold weather as in hot—there's nothing like Texaco Olympian Grease in your mine car wheels. And that goes whether bearings are plain, cavity hub or anti-friction.

Texaco Olympian Grease gives longer lasting protection against wear because it stays in the bearings . . . seals out dirt and moisture . . . resists oxidation . . . will not separate in use or

in storage. You'll get longer bearing life with Texaco Olympian Grease and maintenance costs will come down. There are three consistencies to meet every requirement – all easy to apply.

In your hydraulic mechanisms, above and below ground, use *Texaco Regal Oil (R&O)*. This turbine-quality oil keeps systems free of sludge, rust and foam ... keeps operation smooth and trouble-free . . . reduces maintenance costs.

Let a Texaco Lubrication Engineer help you simplify your lubrication, improve efficiency and reduce maintenance costs for all your mine machinery. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TUNE IN . . . TEXACO STAR THEATER storring MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA radio broadcasts every Saturday efferneon.



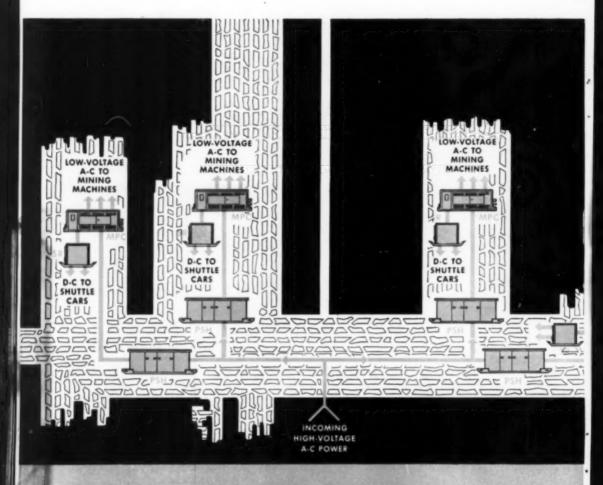
**TEXACO LUBRICANTS** 

and the 11 other months, too . . .



For the Coal Mining Industry











MPC-Mine Power Conter



SR-Selenium Rectifier

## Three

### **100** new developments

### for A-C power systems

Here's the latest and best in power supply for a-c mining—three brand-new Westinghouse developments for use underground. Chart at left shows how they're applied.

### 1. New switch-house controls high-voltage power

High-voltage power comes down a shaft or borehole, then is sent out through individual feeders to the various working areas. Each feeder should be protected. Best way: the new Westinghouse underground switch-house. It immediately isolates the feeder in event of ground-fault, overcurrent or short circuit so that the rest of the system isn't affected.

#### 2. Mine Power Center transforms it down

This new Mine Power Center keeps power supply where it's needed—close to the working face. Four working areas and four Power Centers are shown at left. This new unit is basically an air-cooled transformer with outgoing low-voltage feeders. A circuit breaker protects each feeder against overcurrent and ground-faults.

### 3. New rectifier supplies small blocks of d-c

Here's the ideal way to supply the small amounts of d-c needed in a-c mines. The new Westinghouse selenium rectifier takes a-c from the Power Center and supplies d-c through circuit breaker protected outlets. There are no major moving parts in this unit—the rectifier itself is a simple, static, plate-type device.

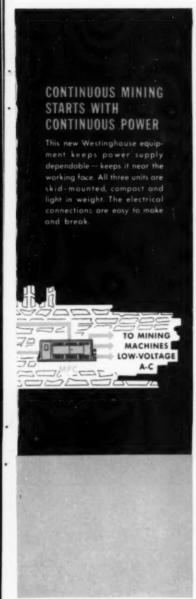
#### Call Westinghouse early on EVERY job

Westinghouse has a great deal of experience in all types of electrical equipment for mining. We can help you cut costs and improve your operations. When your next project comes up, call your Westinghouse office early in the planning stage. And for more information on these three new developments, write for B-5423. Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa.

Westinghouse

EQUIPMENT FOR THE MINING INDUSTRY





# · · · · BELT CONVEYOR AND



This photo shows a Jeffrey Shuttle Car discharging into a Jeffrey Belt Conveyor from the side.

### SHUTTLE CAR COMBINATION

TEAM-WORK

that pays off in

GREATER PRODUCTION
LOWER OPERATING COSTS
INCREASED PROFITS . . .

• The way in which these
Jeffrey Conveyors and Shuttle
Cars work together results
in one of the most modern
methods of transporting coal from face to tipple.

Jeffrey Belt Conveyors for intermediate and main haulage handle large tonnages rapidly and provide low cost maintenance and operation. Extensions are easily and quickly made to keep up with room development.

Jeffrey Shuttle Cars, operating between the loader and conveyor, have come about as close to continuous operation as any system developed to date. Here's team-work at its best. These cars are available in cable reel types with either two or four wheel drive and steering . . . in capacities from 3.75 to 7.75 tons.

Call in a Jeffrey Mining Engineer. He will be glad to help you determine the best arrangement and equipment best suited to your operation.

# Increase PRODUCTION...



West assurance: ... Townsrecker is a new kind of had unit half from the ground up for "off-coad" hauling. It safely travels mountain trails and cross-country as well as highways and city streets. It hauls capacity loads over any kind of ferrain. And, it stands up to tough, rough hauling wark on steep grades with minimum maintenance. Optional Electrolarder provides added broking action for safety on steep grades.

Speed loading . . . Big. wide "to easy for shavel or dragline operators to get faster loading cycles with Tournarockers. Body opening on 9-ten size is  $7' \times 11'$ , on 18-ton is  $9\frac{1}{2}' \times 12\frac{1}{2}'$ , on 35-ton is  $10'2'' \times 17'2''$ . Width is most important because radial distance is hard for operator to judge. Rear of body provides a wide, law entry for the dippor to give





Reduce time dismains ... a touch of electric switch on operator's panel activates heist motor ... means a fest, safe dump, independent brakes and front and rear allow operator to safe-ty back to odge of fill ... lock rear wheels and dump over edge ... yet keep prime mover in forward geer for safety and fast get-away. There is no delay for hydraulic pressure to build up, no slow jacking up by hydraulic pumps. Loads fall free and FAST!

Cleans load every time . . . even in mud and sticky clay, Tournerocker dumps clean. The streamlined body sheds material readily...body can be raised to vertical position to clear lead...no material rides back to the excavator to steel pay-lead room on next trip. Large boulders or oversize rock easily cloor and can safely be dumped over edge of fill. Rocks cannot roll forward against wheels nor can material pile under roar end.





Cut maintenance troubles . . . because Tourn rocker has no hydraulic lift camplications, no high pressure jack lines to keep light, no long drive-shafts to reer-wheel drive, the most common mointenance problems of rear-dump houl units are eliminated. Owners in all parts of the world are reporting acceptionally high mechanical efficiency and lew maintenance costs handling heavy rock and are with Tournarockers. Psechroved Safety... low center of gravity, good clear-ance, high visibility, front-wheel drive, 90° pewer steer, gleat thos, big 4-wheel air brakes, push-butten electric central, big comfertable oir foam cushion seet, high manavarability ... all these features combine to make this rear-dump hauler an imper-tant esset for safety. This permits fast hauling, saves time on dump, and makes it oasier to train new operators.

URNEAU TOURNAROCKERS

TRACTION ADVANTAGES of A CRAWLER PLUS HIGH-SPEED on RUBBER

# fy JOB MANAGEMENT





Cut spotting delays . . . You need fewer "spots" with these BIG hauf units, and, because of their hig tops, it is easier and quicker to put them under the disper. The prime mover no pives at right angles to the body providing a 90° angle for prime mover wheels. That saves time at every apol. Operator can back in fast because he has positive power steer and can step instantly with air-operated multi-disc air brakes.



Work fast in Light guarters... positive power steer, 90° turns, electric controls, multi-disc air brakes that have more braking surface on a single wheel than mest heul units have on all feur wheels... all contribute to fast handling over steep, nerrow, winding pit roads. Glant thes roll easily over rough surfaces, steer easily out of ruis, give operator confidence under the most difficult heuling conditions.



& cleaning . . . giant tires, big, four-wheel, ikes, powerful front-wheel drive, plus the rocker make it easy for the Tournarocker operator to s entire load cleanly and safely over the bank even on a This reduces time and expense of dump clean-up, pro-ntinuous free dump area along entire fill, eliminates rs and speeds up haul cycles.



even when crawlers can't get through! Giant tires, 2' wide and ever 7' diameter, give ample flotation for self going. When a wheel slips, Tournamatic differential applies 4 times the pull to wheel on Armest feeting. Independent power steer turns prin mover to seek new feeting for better traction to pull out of mo





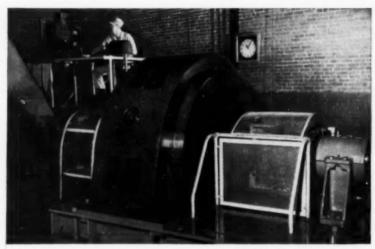
mail today to: H. G.	LETOURNEAU, INC., Peoria,	Illinois
NAME		Send us more information
COMPANY		
STREET		9-ton, 28 m.p.h. Tournarocker
CITY	STATE	
Type of work		35-ten er 50-ten Tournerecker



# Mine output gets a lift with G-E hoist drives

265-foot shaft...

450 trips per day!



in this Pennsylvania coal mine the coal hoist averages 450 trips every 24 hours, working two eight-hour shifts a day. Its G-E a-c hoist drive helps maintain output because it provides high service continuity, needs only minimum maintenance. Shown here is the G-E 500-hp 2200-volt induction motor driving the hoist.



This G-E metal-enclosed primary control panel in the same mine incorporates the line circuit breaker, providing emergency disconnecting, and the primary reversing contactors. Completely wired and factory-assembled for quick, easy installation, this packaged unit includes everything needed.

G-E secondary control, shown at right, includes secondary resistors and accelerating contactors, embling the operator to properly accelerate and decelerate the hoist mostor with the master switch.



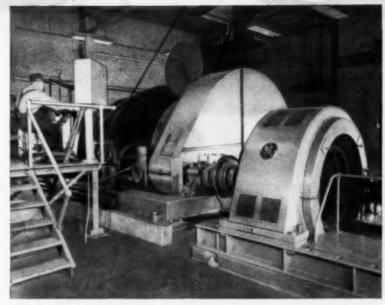
GENERAL



ELECTRIC

500-foot shaft...

888 trips per day!



In this large West Virginia coal mine, a G-E equipped coal hoist was recently installed to increase output. Hoisting 7100 tons of coal plas 1000 tons of slate mined per day, it makes 888 trips per 14½-hour day yeu 500-foot shaft. The G-E 800-hp 2200-volt a-c hoist motor shown here is giving top day-in-day-out service.



Secondary resistors for this hoist are balconymounted above the secondary control, providing a space-saving, aut-of-the-way installation. Primary control panel (not shown) was also supplied by G.E.

To improve power factor in the mine, this G-E metal-enclosed Pyranol® capacitor equipment—rated 540 kvar, 2400/4160 volts—was also installed. G-E capacitors reduce power costs, release system capacity, improve voltage levels and cut power losses. With no moving parts, they need practically no maintenance. \*Reg, tradement of General Elsektic Company





### Mine-Hoist Drives

.. to cut mining costs!

These are only two of over 900 G-E large mine-haist drives now in service, helping to raise mine output and lower hoisting costs. For skilled help on your mine-haist drive whether it's a-c or d-c -call a G-E mining specialist at your nearest G-E office. General Electric Company, Schenerlady S, N. Y.



### Saginaw Dock & Terminal Co. Belt reinforced with "Cordura" rayon holds trough on long slope conveyor

STRONGER AND THINNER, this "Cordura" rayon reinforced belt measures 912 feet between centers. It can deliver  $2\frac{1}{2}$  tons a minute up a 245-foot lift on a 16 degree slope. Driven by a 50er motor through a gear-speed reducer, it travels at a d of 280 feet per minute.



Under any loading condition, this 30-inch slope belt at Saginaw Dock and Terminal Company's #1 mine at St. Clairsville, Ohio, trains perfectly. It was manufactured by the Goodyear Tire and Rubber Company on a 4-ply fabric carcass made of Du Pont Cordura\* High Tenacity Rayon.

Why do belts train better when reinforced with "Cordura" rayon? Here's the reason. "Cordura" rayon yarn is stronger than yarn of natural fibers. It will make a belt full strength with fewer plies. These thinner belts are more flexible and so trough better. Besides, the low stretch of "Cordura" rayon saves costly shut-downs for take-up and resplicing.

Before you order your next conveyor belt, be sure to look into the advantages of belts reinforced with this heavy-duty Du Pont yarn. We'll be glad to send you a list of the names of suppliers, and full information about "Cordura" rayon in a new booklet, "Sinews for Industry." For your free copy, address: Rayon Division, Room 4421, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

Du Pont "Ordura" High Tenacity Rayon

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY



tough mine power cable?

ir's ANACONDA BUTYL-INSULATED

### **High Voltage Cable**

No metal armor or lead sheath, yet . . .

There's even greater mechanical and electrical protection in the combination of neoprene jacket and butyl insulation.

Together they provide:

Unequalled protection from impact, crushing, twisting and abrasion. Higher dielectric strength.

Greater resistance to moisture, acids, oils, ozone, heat and flame.

Less weight, more flexibility; easier to handle, install, splice and maintain. Lower first and final costs!

E3349

ANACONDA Butyl-Insulated High Voltage Cable is the modern cable for any mine—particularly mechanized mines. Anaconda also specializes in the manufacture of shuttle car cable and cable for the new continuous mining machines. Let our mine service specialists show you, or get in touch with your near-by Anaconda Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

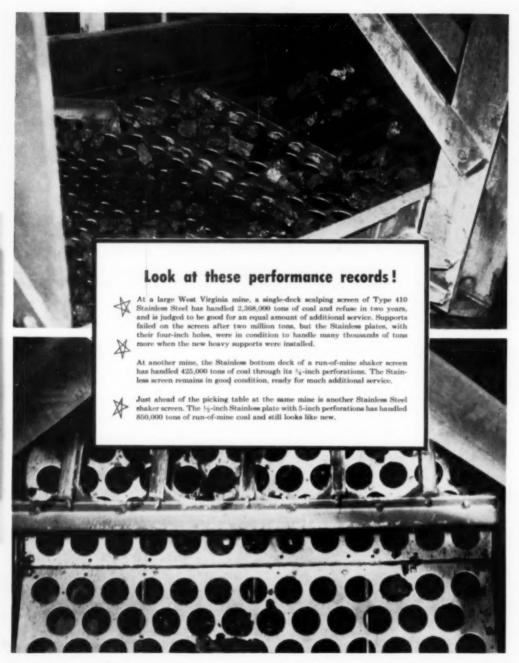


the right cable for the job

ANACONDA

WIRE AND CABLE

### On screens that handle dry, raw coal



you can multiply the tonnage with

# U·S·S 12 Stainless Steel

- and it's available now!

Preparation plant men are reporting up to five times the tonnage before replacement from the use of Stainless Steel on scalping screens, shaker screens and similar equipment handling dry, runof-mine coal.

On these jobs, where abrasion and its results are the major factor, U·S·S 12 (Type 410) Stainless Steel gives outstanding performance. This grade of Stainless is available for your use today; you can begin taking advantage of its economies at once.

This Stainless Steel's tough, durable surface stands up under the grinding wear of ton after ton of coal and rock. High resistance to abrasion maintains hole size, too, thus preventing oversize materials from passing through worn perforations. And Stainless Steel's resistance to corrosion minimizes rusting and subsequent blinding that occur so often after shutdowns.

Longer service life, combined with lower labor costs and fewer plant shutdowns, quickly offsets the higher cost of Stainless Steel screens. And Stainless gives equally economical long-life performance on washers, dewatering screens, conveyors, chutes, flumes and the like.

A modern coal preparation plant's experience with Stainless Steel is described in detail in the booklet, "Stainless Steel at Sunnyhill." For your copy, mail the coupon below.

### U·S·S STAINLESS STEEL

AMERICAN STEEL & WIRE ... . COLUMBIA-GENEVA STEEL ... . NATIONAL TUBE ... . TENNESSEE COAL & IRON UNITED STATES STEEL SUPPLY, WAREHOUSE DISTRIBUTORS ... . Division of UNITED STATES STEEL COMPANY, PITTSBURGH



2-154

UNITED STATES STEEL

# "WE USE 'CATERPILLAR' DIESEL ENGINES

**EXCLUSIVELY"** 

W. J. FUTCH, Joseph Futch & Sons, Exeter, Pa.



This Manitowoc Speedcrane with 120foot boom is powered by a "Cat" D386 Engine. Working in a coal mine near Wyoming, Pa., this team strips overburden at the rate of 5 cubic yards every 1½ minutes.

"The D386 handles the Speedcrane in rough going or in any kind of condition," W. J. Futch says. "We are using 'Caterpillar' Diesel Engines exclusively in all our equipment. Long life and wearability are the main reasons we specify them." In addition to the D386, his outfit's lineup includes a D318 powering a Lima Paymaster, a D13000 in another Speedcrane and two "Cat" D8 Tractors.

All "Caterpillar" Diesels are ruggedly built for rough going. But this is a good point to remember: With proper maintenance, you'll get greater working capacity and longer life from them. A few minutes' care a day may save you costly down-time. Follow the procedure in your Operator's Instruction Book. And talk over your problems and needs with your "Caterpillar" Dealer — he's near by to help you every way he can!

CATERPILLAR TRACTOR CO., Peeria, Illinois

### CATERPILLAR



11-BU-LOADER

### **NO.1 MACHINE IN THE WORLD**

for Productivity

Unmatched durability, due to its advanced, simplified design—that's the key to the production records and popularity of the JOY 11-BU, the world's most widely used thick-seam coal loader. It actually has less than one-third as many wearing parts, and only half as many points to lubricate, as comparable machines!

Breakage of the gathering mechanism, or failure of any kind other than by normal wear, is virtually unknown on the 11-BU. The rigid gathering head is compact and very solid. "Tight" shots can be loaded out without fear of damage to the loader. Similarly, corners can be loaded out quickly and easily—striking a solid rib will not cause injury to the rugged gathering arm. With a capacity up to 10 tons per minute in seams of 60" or more, the entire machine is built for rough, tough service, such as handling both coal and rock in split-seam mining. To combat tail-conveyor damage, the rear roller-shaft is considerably oversize, and like all assemblies of the II-BU, is readily accessible for easy maintenance. • Let us show you how JOY Loaders and other mining equipment can increase your production and profits—no matter what your conditions may be

Consult a Engineer

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING . PITTSBURGH 22, PA

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

Here's your Field-Proved, Mobile



### 20-BU-I LOADER

Only 24" high, yet can load up to 8 tons per minute. Fast tramming, easily maneuverable, features independently driven conveyor and gathering head. While a shuttle car is away, the gathering arms can provide a fully-loaded conveyor ready for quick loading when the car returns. Also permits continued loading even if the gathering arms are momentarily stalled with hard digging.



### 8-SC SHUTTLE CAR

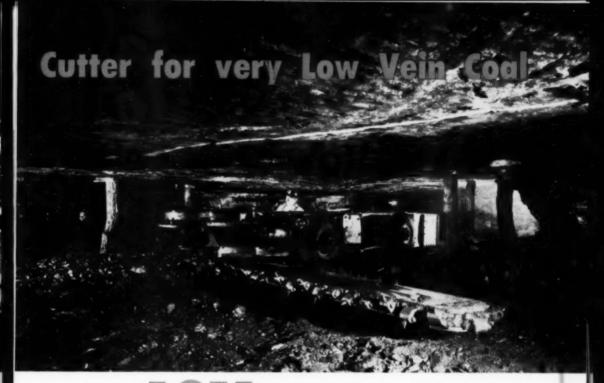
Features 4-wheel positive drive, 4-wheel hydraulic steering, tapered-end design for minimum turning clearance, height of only 26" and level capacity of 2 tons. Separate motors for traction, conveyor drive, and hydraulic pump drive. Disc-type brakes on all wheels, hydraulic cable reel and hydraulically-adjustable elevating discharge.

and here's the rest of the JOY LOW VEIN TEAM

SULMET CARBIDE BITS

Joy Sulmet Bits, tipped with sintered tungsten carbide inserts, are made in a variety of types and different degrees of hardness to meet any mining condition. They fit any cutter, and by actual case records, out-perform every other bit on the market.





# 12-RB CUTTER

Have you seen this film?

"TRACKLESS MINING IN COAL"

Write for a FREE Showing

idress our Film Booking Office

### FAST TRAMMING, FAST CUTTING for HIGH PRODUCTION

Meet the JOY 12-RB, above . . . the cutter member of the only mechanized mining team designed specifically for highcapacity production in very low vein coal. With the Joy 20-BU-1 Loader and 8-SC Shuttle Car, it assures fieldproved flexibility and economy never before available to mines operating in extremely thin seams.

The 12-RB is a highly mobile and maneuverable rubbertired cutting machine only 26" high, supplied either as a top or bottom cutter, and readily convertible. Its high tramming speed and variable hydraulic feed (which provides a greater cutting feed speed than shortwall machines) together permit cutting more places per shift. Bar tilt, roll and lift are hydraulically controlled, and steering is also hydraulic, with a separate motor serving the hydraulic pump.



NERAL OFFICES: HENRY W. OLIVER BUILDING

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

# JOY GLAMPION

### **BLAST HOLE DRILL**

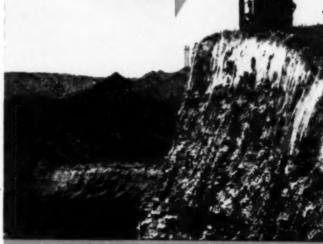
DRILLS DRYThe ALL WEATHER,
SPEED and
ECONOMY CHAMPION
for
COAL STRIPPERS

The Joy Champion, a continuous-type rotary drill that drills dry, is the only drill of its type in the field. A tri-cone, roller-type bit pressure-cuts the rock while an air blast removes cuttings and cools the bit. Instant removal of cuttings keeps the bit working on bare rock for maximum drilling speed. Where fine dust from hard, abrasive formations may be a health hazard, a new bagtype dust collector provides 100% dust collection.

Elimination of water lines ends winter freezing. Rigid drilling stem, plus hydraulic feed pressure and rotation speed control, prevents bit "wander" and insures finishing every hole. The straight, smooth-walled holes are easier and safer to load and assure topmost blasting efficiency.

The Joy Champion trams at speeds up to 5 mph on crawler treads, and sets up quickly with 3-point hydraulic leveling. It drills vertical holes from 5½" to 7¾" dia., to any normal depth required. The two models, Mediumweight and Heavweight, are available with either

Consults a Goy Enquier



One of six Joy Heavyweight Champions operating at one of the world's largest bituminous strip mines.



JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING . PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

# Lippmann lifersealed Ball Bearing Idlers



### Shielded for hard mining service

Meet the champion of heavy duty conveyor idlers, built specifically for hard mining service! Compare its construction, feature by feature, with any other and you'll agree it's the idler you've been looking for. These Lippmann Life-sealed idlers are permanently lubricated — the cost of catwalks and periodic greasing has been eliminated and the bearings are sealed against water, dirt and wear. In addition, trough-like rings on the idler heads shielded by hoods on the support brackets shed dirt and water away from the bearings.

Lippmann conveyors and other mining machinery are backed by 28 years of manufacturing and application experience. Lippmann engineers are ready to help you, and a card or letter will bring prompt attention to your regular or special requirements. Lippmann Engineering Works, 4627 W. Mitchell St., Milwaukee 14, Wisconsin.





LIPPMANN

CRUSHERS FEEDERS SCREENS CONVEYORS ELEVATORS HOPPERS BIN



"Couple of years ago, the boss asked me to start checking our wire rope costs. He wanted a little system of records that would tell us what each rope was doing, and how much work we were actually getting from it. Figured we could learn the brand that would last the longest—and cost the least—on our type of work.

"So I started keeping track. In our case, the jobs involving rope boiled down to a matter of tonnages moved. Wasn't at all hard to record what each rope accounted for in its lifetime. When I'd been checking long enough for the figures to have some meaning, I showed 'em to the boss. By then I could tell which make of rope was doing the best job for us, costwise

and every way. The figures really opened our eyes!"

These men weren't the first to learn the value of checking rope performance. Many users of Bethlehem wire rope follow the practice regularly. We're always glad to see it, for it enables actual comparisons between brands . . . and we know that in any such comparisons, Bethlehem rope will stand out from the crowd.

Here's a fair suggestion: over a period of time, stack the Bethlehem product against any other brands of your choice. Keep tabs on them all, and at intervals study your figures. Our guess is, those records of yours will prove beyond question the solid economy—the long-term economy—of Bethlehem wire rope.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Carporation

Expart Distributors Bethlehem Steel Expart Carporation



LET YOUR RECORDS TELL YOU!



# **Under water 9 months**

### -this belt is still in service!

The mine you see here was flooded to douse a below-ground fire - then pumped dry and reopened nine months later. And the G. T. M. - Goodyear Technical Man found that the Coal-Flo main conveyor was as good as new and didn't need a thing done to it before going back in service!

Coal-Flo conveyor belts are serving under all sorts of below-ground conditions, handling r.o.m. coal longer, with minimum maintenance and maximum savings for mine operators. Ask the G.T.M. to discuss your coal-handling problems, or write Goodyear, Akron 16, Ohio.



GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD" - Every Sunday - ABC No.



### "Carlon" is easier to handle!"

#### \* THE FIRST REAL PIPE THAT IS PLASTIC

Lightweight, flexible, requiring fewer fittings... CARLON plastic pipe is easier to handle. Weighing only % as much as steel pipe of equivalent size, it eliminates the need for materials handling equipment. Flexibility permits CARLON to conform to irregular surface contours and curving slopes and entries. Furnished in long lengths (up to 400 feet) CARLON requires fewer fittings than ordinary pipe.

CARLON plastic pipe assures longer trouble-free service life. It is guaranteed against rot, rust and electrolytic corrosion and is unaffected by the chemical action of sulphurous waters, alkalies, metallic salts and other corrosive wastes. Its smooth internal surface will not accumulate scale or sediment.

FLEXIBLE CARLON is produced in all standard pipe sizes, and a complete line of molded plastic fittings is available for plastic-to-plastic or plastic-to-metal connections.

NOM.	0.0.	1.0.	P.S.I.	WT LBS. PER FT.	LENGTHS
12"	0.840	0.622	540	0.103	400 ft. coils
20"	1.050	0.824	350	0.140	400 ft. coils
F	1.310	1.070	200	0.181	300 ft. coils
D'a"	1.660	1.380	200	0.267	300 ft. coils
112"	1.900	1.610	200	0.320	250 ft coils
2-	2.378	2.070	170	0.445	200 ft coils
212"	2.875	2.469	170	0.680	200 ft. coils
3-	3.504	3.070	165	0.910	100 fr. coils
4"	4.504	4 030	150	1.250	25 ft. str.
6"	6.630	6.070	115	2.230	25 ft ste.

Specify the Pipe with the Stripe!

RED-Heavy-duty Pip

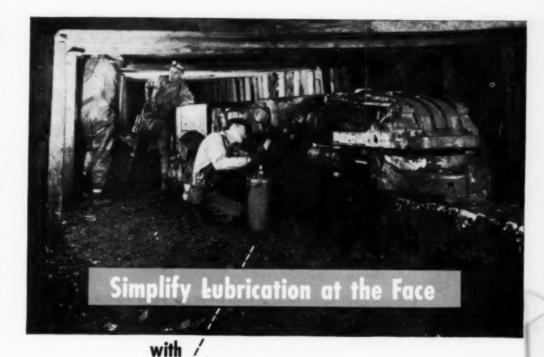
WRITE FOR CATALOGS



CARLON PRODUCTS CORPORATION

IN CANADA: MICRO PLASTICS, LTD., ACTON, ONTARIO

10300 MEECH AVENUE . CLEVELAND 5, OHIO



### GULF MINING MACHINE LUBRICANT

### —it does the job of 2 or 3 other lubricants

### —and does it better!

When you use Gulf Mining Machine Lubricant, you can eliminate from 2 to 3 other lubricants depending on the type of equipment you operate. One lubricant and a hydraulic oil for all points except the armature bearings means less confusion at the face, elimination of application mistakes.

At the same time Gulf Mining Machine Lubricant provides better protection for vital parts in cutting and loading machines. Here's why:

- Its heavy body insures less leakage from housings and gear cases.
- INDUSTRIAL LUBRICATION

- Its superior lubricating value insures less wear.
- 3. Its greater adhesiveness prevents throwoff.
- 4. It resists the washing action of water.
- It is equally effective for plain and antifriction bearings and for certain types of drives and transmissions.

To get the many benefits possible with this quality product, call in a Gulf Lubrication Engineer. Write, wire, or phone your nearest Gulf office today, or send the coupon below.

<b>Gulf Oil</b>	Corporation	- Gulf	Refining	Company	C
719 Gulf	Building, Pitt	sburgh	30, Pa.		

Please send me, without obligation, a copy of your pamphlet "Gulf Mining Machine Lubricant B."

Company

Title

# STEEL SCRAP is VERY SCARCE



America's steel industry is essential to the nation's defense.

Large quantities of scrap are used by the steel industry.

YOU—in your plant or on your property have scrap that's urgently needed.

Unless you turn your scrap over to your scrap dealer, the steel so vital to American industry cannot be made.

# GET YOUR SCRAP MOVING...TODAY



Wire Rope—sinewy muscle of industry—is one more of the many products of steel upon which America depends for the increased production necessary to meet both civilian and defense demands.

Here, too, your scrap contribution is of vital importance... enabling us to serve you better...helping to provide you with continued, uninterrupted supply.

THE CALIFORNIA WRIE CLOTH CORP. — Los Angales « Oukland » Partiand « San Francisca » Saettla » Spakens
THE COLORADO FORE, B. ROM CORP. — Abilesa (Tex.) « Denver « Houston» Odesna (Tex.) » Phosain» Salt Laka City « Tuha
WICKWIRE SPENCER STEEL DIV. — Baston » Buffala » Contanonoga » Chicago » Detroit » Emisanton (Pa.)
Philodolphia » New York

LOOK FOR THE YELLOW TRIANGLE ON THE REEL WICKWIRE ROPE



PRODUCT OF WICEWIRE SPENCES STEEL DIVISION THE COLORADO FOEL & IRON CORPORATION



### FOR LOW COAL Over-all Heights 20" and 24"

New gear principle requiring fewer parts delivers the perfect shaker motion to pan line with less stress. Maintenance cost is low, the operation of all accessory equipment is smooth and easy.

> Your inquiry for full details of these profit producing drives for low coal will receive prompt attention.

#### HIGH CAPACITY DRIVES FOR LOWEST WORKABLE SEAMS WITHOUT TAKING TOP OR BOTTOM

Also available are these new labor-saving accessory items: column type troughing, hydraulic jacks, crosscut drive, roller frame for swivel trough which eliminates pendulum, locking handle on trough supports. Let us give you complete information.





DEPENDABLE

under severest conditions of dust and dirt!

### DODGE-TIMKEN

- Even under layers of grime, dirt and abrasive dust encountered in many production operations, the Dodge-Timken Type C bearing carries its power load smoothly, efficiently, without interruption—because it's
- Triple-seeled to prevent the entry of dust, however fine. Accurately machined steel seals keep dirt out and lubricant in.
- Dodge mounts, seals, houses Timken precision bearing units in rugged assemblies

(four different types) to deliver a minimum

- of 30,000 hours uninterrupted service.

  Dodge Timken Type C Pillow Blocks are fully self-aligning, with both radial and thrust carrying capacity.
- Delivered fully assembled, adjusted and lubricated, ready to lock on shaft. Locking collars at both ends insure firm fastening.
- Normally available from Dodge Distributors' stocks, sizes from 1-7/16" to 4-15/16".

DODGE MANUFACTURING CORPORATION, 3000 Union Street, Mishawaka, Indiana



of Mishawaka, Ind.



CALL THE TRANSMISSIONERS
your local Dodge Distributor for assistance on new,
cost-saving methods. Look
for his name under "Power
Transmission Equipment"
in classified phone book.





T-RELTS AND TAPER-LOCK SHEAVES



TARREST AND COURSE DESIGNATION

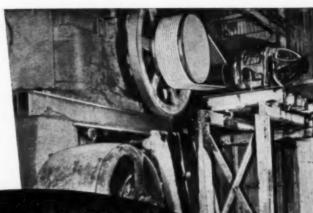


WELLING GRAP AND DIAMOND & CLUTCH



SOLID STEED, CONVEYOR PULLEY

A large jaw crusher at the mill of a big copper mine in Sonara, Mexico, is driven by Gates Vulco Ropes. Picture shaws the discarded motor still in foreground.



the Concave Sides of GATES VULCO ROPES
mean lower V-Belt Costs!



What Happens When a V-Belt Bends

Straight-Sided V-Belt

Fig 1

Fig. 1-A

How Straight-Sides V-Belt Bulges in Sheave-Groove. Sides Fress Unovenly Agelast V-Pulley Causing Extra Wear At Paint Shown by Arraws. Gates Vulco Rope with Concave Sides

Fig. 2

Fig. 2-A

The Cancave
Sides fill out to a
Procise fit in the
Sheave Graeve.
No Side Bulge!
Sides Press Evenly
Against the
V-Pullay — Uniform
Wear — Longer

Every engineer'knows how a V-belt changes shape when it bends around a pulley.

The top of the belt is under tension-making it grow narrower.

The body is under compression, causing the sides to bulge out!

Look at figure 1-A in the diagrams, herewith. There you see how a straight sided V-belt is forced to bulge in its sheave-groove—and this bulging naturally causes extra wear along the middle of the sides as indicated by the arrows.

Now look at the figure 2-A. There you see how the precisely engineered Copcave Sides fill out to an exact fit in the sheave groove.

Clearly, the Concave Sides press evenly against the V-pulley. This means uniform wear; longer life! The Concave Sides have full traction; wear longer because of full contact!

To sum up: The Concave Sides of Gates Vulco Ropes (U.S. Patent No. 1813698) give you (1) Less wear, (2) More pulley contact, (3) More sure power transmitted when needed!

Only V-belts made by Gates are built with concave sides. Whenever you buy V-Belts, be sure you get the V-Belt with the Concave Sides—The Gates Vulco Rope!

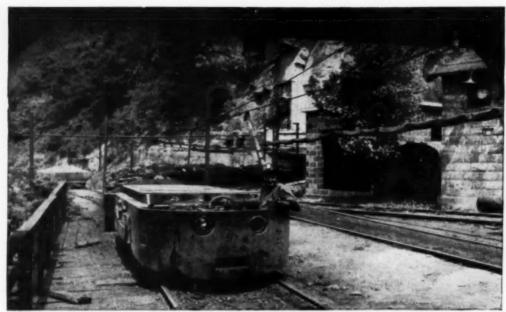


World's Largest Maker of V-Bells

VULCO PRIVES

IN ALL INDUSTRIAL CENTERS

THE GATES RUBBER COMPANY . DENVER . U.S.A



This 13-ton, 48-inch gage G-E mine locomotive at Ames Mining Company, Fayette, W. Va., is one model in the complete

G-E line of mine haulage equipment: trolley-type, cable-reel, and storage battery locomotives; shuttle cars; and trammers.

# EASY TO HANDLE. PLENTY OF PULL"

Says Mr. Paul Morton, Superintendent, Ames Mining Co., of versatile G-E 13-ton mine locomotive

Averaging 100 tons per load, the 13-ton G-E mine locomotive operated by Ames Mining Company, Favette, W. Va., makes as many as fifteen trips per day. Added to this schedule are such duties as shunting, spotting cars at the dumper, and returning empties for reloading. Ames personnel have declared the G-E locomotive "easy to handle with plenty of pull." Top availability, quick, easy maintenance and long periods between overhauls have backed up this peak performance with real savings.

You can count on the same efficient, money-saving performance from the General Electric mine locomotive that's right for your job. Tough, carefully engineered construction gives them staying power, cuts down maintenance expense. Smooth pickup starts big loads, and there's plenty of power for the haul. Your nearby General Electric representative can show you how the right G-E mine locomotive will bring the loads out faster and save you money. General Electric Company, Schenectady 5, New York.

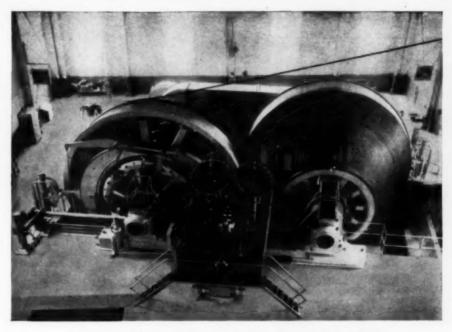
You can put your confidence in\_



GENERAL ELECTRIC

February, 1952 · COAL AGE

## WIRE ROPE



### For shaft, incline and haulage service specify Roebling

WHEREVER WIRE ROPE is subjected to excessive abrasion or bending and acceleration stresses . . . to heavy loads and high speeds . . . the proper Roebling Preformed "Blue Center" Steel Wire Rope will last longer and save money. "Blue Center" steel is an exclusive Roebling development that assures real toughness. Roebling Preformed also

adds extra handling ease and smooth performance.

Roebling makes a full line of wire rope. Have your Roebling Field Man recommend the ones that will meet your needs with top efficiency and economy. And for biggest savings, get his advice on the correct use and maintenance of wire rope. John A. Roebling's Sons Company, Trenton 2, New Jersey.

# ROEBLING

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Texas, 1920 E. 2nd St \* Philadelphia, 230 Vine St \* San Francista, 1740 12th St \* Santis, 900 1st Ave, S. \* Tefas, 321 N. Cheyenna St
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tonnage capacity per shift.

Write for more information on Eimco Agidisc Filters.

#### BRANCH SALES AND SERVICE OFFICES

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JOY Price Sheet 5212-2.1

#### STANDARD ROUND



JOY Price Sheet 5212-2

#### STANDARD OVAL



JOY Price Sheet 5241-2 & 3

#### SHROUDED OVAL



JOY Price Sheet 5211-4

#### PUSH-PULL STYLE

#### ELECTRICAL CONNECTORS

Your confidence in JOY Electrical Plugs or Receptacles is always justified. Job-proven on thousands of installations under every conceivable working Job-proven on thousands of installations under every conceivable working condition during the past quarter-century, they're unequalled for performance, safety and durability. One-piece-molded-to-cable design (details at left) makes them water-tight, shatter-proof and amazingly age resistant . . . and because they're made of Neoprene, oils, acids, alkalies or moisture have little effect on their life span or conducting efficiency.

Available in a wide variety of conductor numbers and sizes, they are ideal

for connecting electrical power to all kinds of portable machinery or semi-

stationary equipment subject to periodic relocation.

Remember—JOY job-proven Plugs and Receptacles actually cost less because they last longer. Ask for full details with descriptive literature today.



- strengthens cable connector junction Tough, molded-as-a-unit Neoprene Jacket resists wear and increases safety
- Expert Pin and Socket design (see below) insures low-contact resistance
- Neoprene faces fit closely when engaged, insuring a water-sealed connection

Provide a long life of snug low-resistant con-

tact. Spring-loading causes I.D. of socket to match O.D. of its mating male pin during

engagement. Unique design prevents bell-

0 JOY Male Connector Pins have no split ends to collect dust or increase resistance. They are accurately machined as solid units from high quality rod, carefully selected for its low resist-

SPRING LOADED FEMALE SOCKETS

mouthing or over-expansion.

SOLID MALE CONTACT PINS

#### CHOICE OF JOB-PROVEN STYLES

PUSH-LOCK . . . Slight twist during engagement locks connectors and prevents accidental disconnects. Available in 32 volt rating for welding needs. Also supplied in 600 and 5000 volt designs.

STANDARD ROUND . . . A favorite of many years standing. Single Conductor designs available for 600 or 5000 volts . . . multiple designs rated at 600 volts. multiple conductor

STANDARD OVAL . . . Best for general all-around use. Available in polarized three and four or nonpolarized three conductor designs rated for operation at 600 volts or less.

SHROUDED OVAL . . . Extended skirt or shroud on male plug guards contact pins. Available in polarized three and four conductor designs rated for operation at 600 volts or less.

#### WIDE SELECTION OF MATING RECEPTACLES



There's a JOY Receptacle or Gang (multiple outlet box) for nearly every standard electrical need. All box) for nearly every standard electrical need. An have one-piece replaceable Neoprene inserts manufactured to the same exacting specifications set up for JOY Portable Plugs (see description above and at left). Many are available in choice of terminal back or pig-tail lead designs. UNIT ILLUSTRATED is Joy's No. 352MM, curved base three conductor Machine Receptacle.

#### CABLE VULCANIZERS . . .

JOY Vulcanizers for repairing and re-jacketing cable splices, quickly pay for themselves. Two designs are available, "seeam" and 'direct heat". Both are elec-trically bessed and have automatic tem-perature controls. Bulletin RV106 describes them in detail and lists mold vs. cable sizes. Ask for your free cupy, now!



ance and wearing qualities.

W & D ME3466

GENERAL OFFICES: HENRY W. OLIVER BUILDING

IN CANADA JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

Want stronger mine roofs?

Roof Bolting is the Answer

A strong roof in the mine means fewer accidents, lower operating costs, increased profits.

To help operators obtain roofs which are stronger, and less apt to fall, Bethlehem has developed the two roof bolts shown here. These bolts are

made of new-billet steel, in a variety of lengths.

Either bolt can be used vertically, or at angles. Either bolt is suitable for use with roof ties, roof channels, roof plates, plate washers, or angle washers. If you would like to have full particulars, get in touch with us at Bethlehem, Pa.

#### BETHLEHEM SQUARE HEAD ROOF BOLT

Consists of special 34-in. rolled-thread bolt, with expansion shell. Special unchamfered square head for adequate wrenching surfaces. Forged washer under head for good bearing surface. When assembly is tightened, bolt is engaged by forged-steel tapered plug, bearing against corresponding flat surfaces on inner sides of expansion shell. Pressed ears on bolt support expansion shell while anchoring.

#### BETHLEHEM SLOTTED ROOF BOLT

(forged slots are uniformly centered)

End of bolt is slotted for 6 in., forming equivalent of two half-rounds. Slot is made by exclusive forging process, and accommodates a wedge. Opposite end of bolt has 5 in. of 1-in. rolled thread. When back of hole is reached, wedge is forced deep into slot, expanding end of bolt to provide tight grip. Bolt is furnished with regular square nut unless otherwise specified. Truncated cone point prevents battering of threads.



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Expert Distributor: Bethlehem Steel Expart Corporation

BETHLEHEM MINE ROOF BOLTS



# DEVELOPMENT OF ANHYDREX SAVES THOUSANDS OF LEAD

Research sometimes pays large and unexpected dividends. When Simplex was developing the first rubber-jacketed underground cable, our object was to eliminate the use of lead in order that you might have lighter cables, ones that were easier to install, and were very much easier to splice.

Now it appears that another dividend, unexpected but valuable nevertheless, has accrued from this research work. In fact, the development of the first rubber-jacketed underground cable has opened the door to enormous savings of one of our vital national resources.

Today millions of feet of cables that without Simplex research would have required thousands of tons of lead for cable sheaths, are operating dependably in all types of jobs, from airport lighting to railway signaling. Instead of being used for cable sheaths this lead can now be used for much more important service for everything from storage battery plates to tetraethyl lead for gasoline.

ANHYDREX is only one of many improvements in the art of cable manufacture to come out of Simplex Research and Development Laboratories.

# SIMPLEX HNHYDREX SIMPLEX WIRE & CABLE CO. 79 SIDNEY ST., CAMBRIDGE 39, MASS











For construction





For better service and more economy . . . use

PREformed and Internally Lubricated

#### A THOUSAND AND ONE

to order from assures the right rope for your equipment







For drilling



For industrial

There is a Macwhyte Wire Rope that has been specially engineered and job-proved for any particular type of equipment you operate. That's why it pays to specify Macwhyte. Over the years, ropes for all types of equipment in every field have been developed by Macwhyte. Recommendations are promptly available either from Macwhyte distributors or Macwhyte Company, 2931 Fourteenth Avenue, Kenosha, Wisconsin.

#### Ask for these helpful bulletins:

"Wire Rope—So Wbat?" (No. 5134)—Illustrated exclusive interview with veteran wire rope engineer who talks straight from the shoulder about saving hundreds of wire rope dollars.

"How to Order Wire Rope" (No. 5025)— Tells exactly what to consider. Also includes convenient table of sizes, constructions, strengths and weights of Improved Plow Steel Wire Ropes.



COMPANY

KENOSHA, WIS.

Mill depote New York + Pittburgh + Chicago + Minneapolis + Furt Worth + Portland + Seattle + Los Angeles. Distributors throughout U. S. A. and other countries corry shocks. ils \* Fort Worth \* Portland \* Southle \* Son Francisco



#### Stand-Out On the Coal Seam

BECAUSE they load fast and load big ... because they stay on the job year after year for dependable output ... because they're easy on the operator and low on operating and maintenance costs — these are some of the reasons why Bucyrus-Eries are such outstanding performers on coal seams all over the nation. Experienced Bucyrus-Erie design provides the balanced speeds and power that mean a fast, smooth cycle. Careful laboratory control of materials puts strength and durability into every

part. Simple, easily accessible machinery means less time out for servicing and maintenance. Your Bucyrus-Erie distributor has full information on %- to 4-yard gasoline, diesel and single-motor electric excavators. See him for complete details.



SOUTH MILWAUKEE, WISCONSIN

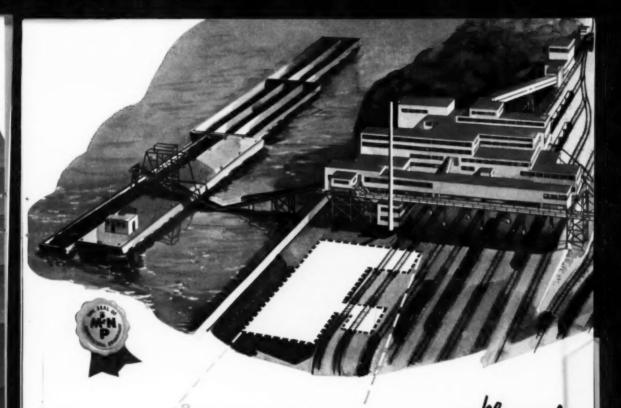
MCNALLY PULSO The Dustless DRYER

Here's one of the Dryers that goes in this addition

M'NALLY S PITTSBURG

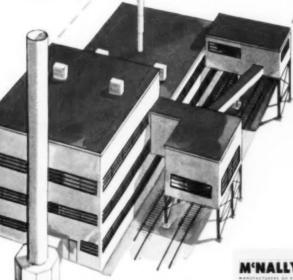
It's among the first of these Pulso dustless dryers in the United States. It had to be dustless, with no possibility of air pollution, as this plant is within the suburban area of a large city. The McNally Pulso solves thermal drying's most difficult problem in the 3 s' x zero range. Surface moisture of coal controllable to suit your market requirements. The fine coal finished product is as dry as tinder... and ton for ton of coal fed in, It's available in tonnage capacities to meet your needs.

McNally Pittsburg Manufacturing Corporation — Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio Engineering & Sales Offices: Pittsburgh • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio



Evaporating 3,000 Gallons of Water Hourly... to make Fuel

Premium Quality Fuel



as it appeared in Fortune Magazine)

The Great Truax-Truer Preparation Plant at Ceredo, W. Va., illustrated at the top of the page, was built by McNally Pittsburg to make clean coal, and now the ultimate will be achieved by the removal of moisture from the coal after washing.

The McNally Pulso Thermal Drying addition, now under construction and illustrated in the foreground, is designed to reduce the surface moisture of coal to a predetermined percentage. This elimination of unwanted water upgrades coal to meet the varied mass production demands for modern metallurgical, industrial, and domestic coals.

The mammeth washing and classifying unit already in operation provides facilities for both rail and waterway transportation. At the record speed of 1,000 tons per hour, coal can be transferred by this unique river loading facility from railroad cars to river barges or from the preparation plant to barges... an example of McNally engineered flexibility.

Consult with us on how to upgrade your coal to satisfy customers' rapidly growing demands for premium quality.

M'NALLY & PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COME & BUT



NOW... SCI

SCREEN FINE, MOIST MATERIALS



Without Blinding!

NO "TIME OUT" to clear fine or medium mesh screen cloth! You can screen fine, moist non-combustible materials continuously with new Thermo-Deck heating unit.

**INCREASED CAPACITY!** Heated screen cloth remains open, permitting more tonnage through the screen and better separation.

LOWER COSTS! Operating records show that heated screen cloth lasts up to three times as long when cloth does not have to be pounded free of blinding material. The *Thermo-Deck* heating unit can be easily applied in the field. Your nearby A-C representative can give you more details. Allis-Chalmers, Milwaukee 1, Wisconsin.



POWER ON — Thermo-Deck heating unit keeps screen cloth clear on screen handling fine, moist material.

#### Send for ...

New 8-page bulletin containing complete facts on operation and application of the Thermo-Deck heating unit.

Bulletin 07B7812

A-3619



POWER OFF — Troublesome blinding results on same screen when Thermo-Deck heating unit is turned off.

Thermo-Deck is on Allis-Chalmers trademark

## **ALLIS-CHALMERS**

Sales Offices in Principal Cities in the U.S.A. Distributors Throughout the World.















Pulverator

Jaw Crushers

**Gyratory Crushers** 

Grinding Mills

**Vibrating Screens** 

Kilins, Coalers, Dryers



prevents OCS\*\_Achilles Heel of Conventional Belts!

"Start and stop" vulcanization (the conventional flat press method) can bump conveyor belt costs way out of line due to short life and constant replacements. Here's why: Press overlaps are unavoidable in this method of belt manufacture. They result in overcured segments that weaken the belt.

#### Why Rotocure-made Belts Are Superior to Flat Press

The BWH-pioneered method of ROTOCURE is a continuous, endless curing process of uniform belt advancement. Every inch of the belt is subjected to identical curing - in amount and in time. Thus weak segments due to overlapping are eliminated to the subject of the

nated automatically by the process itself.

#### Why Rotocured Belts Should be on Your Jobs

The weak segments you don't get in BWH conveyor belts mean you do get:

- Increased belt flex life up to 40%.
- 2. Elimination of mechanical distortion at the press ends.
- 3. Constant, uniform stretch.
- 4. Uniform, abrasion-resistant covers.

For years, it's been an established fact among users that BWH Rotocured belts are "tonnage producers." If you want longer belt life, a good size dip in belt maintenance costs and savings per ton in materials conveyed ask your BWH distributor. He knows who's buying the values? Or write us direct.



\*Overcured Sections-present every 30' to 40' in all belts made by the flat press method. Only Rotocuring (continuous, non-stop curing) eliminates this major cause of belt failures.



Another Quality Product of

#### BOSTON WOVEN HOSE & RUBBER COMPANY

Warehouse Stock: 111 N. Canal St., Chicago, Illinois Distributors in all Principal Cities
PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U.S.A.

## Paves Road International TD-24 with Coal

carves out steep haul road that's paved with coal for traction



DOZING ROAD UP 2,000-FOOT MOUNTAIN. Long International constructs well-banked and drained

Only the power and stamina of an International TD-24 make it possible to mine coal from a formerly inaccessible mountaintop near Arista, West Virginia. Where this International dozed and graded its way up the mountainside, loaded coal trucks now lumber down the modern road it left behind.

After finishing the three-mile road, the Big Red TD-24 stripped the overburden, then helped pave and stabilize the road with the first coal mined: Here's how owner Patrick Romano feels about TD-24 performance: "We didn't think it was possible, but the TD-24 built that road in less than three months. It's a powerhouse dirt

pusher that we couldn't do without."

This West Virginia mining operation is only one example of how International's TD-24-the Big Red Champ of crawlers—is opening deposits that couldn't be mined profitably before.

Your local International Industrial Power Distributor has other case histories of how Internationals have made unworked mine property pay off. See him today. Inspect his full stock of approved parts. Watch his factory-trained mechanics at work. You'll know then why International can deliver the "Power that Pays" for you over many years of top production.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

POWER THAT PAYS



INTERNATIONAL

# Every Carboloy Coal gives you

#### ALL-COVERING SERVICE PROGRAM

We offer . . . free . . . these extensive services to help you get even more from mine-proved Carboloy Coal Mining Tools.

- Complete, tuition-free training course for your key personnel. Features: instruction, demonstrations, correct grinding practices. Special helps for your men on cemented carbides in relation to most efficient coal mining.
- 2 Clear, concise maintenance-instruction manual and catalog, No. CM-100.
- 3 Assistance and advice of qualified Field Engineers and your local Carboloy Distributor.

For any of these outstanding services write direct or contact your nearest Authorized Carboloy Distributor listed below.

ALABAMA, BIRMINGHAM 2 Young & Vann Supply Co.

COLORADO, DENVER 17 Mine & Smelter Supply Co.

E & E Mine Service Co.

KENTUCKY, HARLAN General Electric Supply Co. Kentucky Mine Supply Co.

OHIO, CAMBRIDGE Cambridge Machine & Supply Co.

PENNSYLVANIA, WASHINGTON Fairment Supply Co.

TENNESSEE, KNOXVILLE W. J. Savage Co.

UTAH, SALT LAKE CITY 11 Mine & Smelter Supply Co.

VIRGINIA, McCLURE Erwin Supply & Hdw. Co.

WEST VIRGINIA, BLUEFIELD Bluefield Supply Co.

WEST VIRGINIA, FAIRMONT Fairment Supply Co.

WEST VIRGINIA, MONTGOMERY Marathan Coal Bit Co.



# Mining Tool this double benefit

## IN 8 VITAL WAYS

You get maximum efficiency and lower tool cost per ton because Carboloy Coal Mining Tools perform better 8 vital ways. Here they are:

- 1 Our tools cut more coal more freely in less time than any others would under the same conditions.
- 2 They last longer, for each tool has large insets of Carboloy Cemented Carbide, hardest metal made by man, combining high impact strength, toughness, near-diamond hardness.
- 3 You get more regrinds per tool.
- A Each tool stays sharper longer between grinds.
- Carboloy Coal Mining Tools require less power.
- & They put less wear on machines.
- 7 Carboloy Coal Mining Tools reduce time spent in bit changing.
- **8** They require less time for reconditioning.

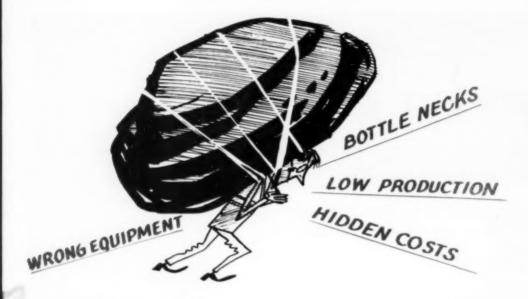
Why not get this bonus performance that's built into Carboloy Coal Mining Tools? See your nearest Authorized Carboloy Distributor or write direct.

CARBOLOY DEPARTMENT OF GENERAL ELECTRIC COMPANY 11120 E. 8 Mile Ave., Detroit 32, Michigan

"Carbolay" is the trademark for the products of Carbolay Department of General Electric Company

CARBOLOY

THE QUALITY BRAND OF COAL MINING TOOLS



#### WHEN A COAL MINE NEEDS A FRIEND

How simple it would be if you could solve your coal production problems just by buying the wonder machines you see advertised! The sad fact is that what these machines undoubtedly can de for one mine they can't do for another. In other words, "it all depends". And only A & G ENGINEERS with an open mind (and no Machinery-Sales-Manager cracking the whip over them) can really help you! Any machinery recommendations we make are strictly on the basis of what's best for YOUR mine. Our sole job is not a sale job. We just cut costs, increase tonnage and UP profits wherever that's possible. And we've made it possible in the smallest as well as the biggest mines everywhere. So if you're interested, first in results and second in machinery, A & G Engineers are ready to work with you. Here and now. Consultation without obligation.

SCOPE OF SERVICES

- Design and construction of new plants and their various units. Organization, operation and manage-ment of mines.
- ment of mines.
  Below ground modernize
  machenization.
  Reconstruction, revemping,
  provement of existing plant
  General consulting work
- consulting work rega
- Valuations for financing texation purpose

praisals.
We work with undivided response to you on a cost and fixed fee we are not hampered by any table prejudice the projudice the projudic



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## SPECIFY

## ALTON

#### BRATTICE GLOTH

#### Always dry— Always flame-proof

FLAME-PROOFING of Upson-Walton dry-proofed brattice cloth does not depend on moisture, absorbed by chemicals. The chemicals used in treating Upson-Walton cloth flame-proof the cloth directly, and are not designed to absorb moisture for this purpose. Thus you can rely on this flame-proofing—under all conditions.

There are other advantages. Since it does not soak up moisture, Upson-Walton cloth weighs less. Grade for grade, weight is cut as much as 15%. This means easier handling and lower costs.

With a dry-proofed cloth, fungus growths have less chance to start. Thus the cloth gives longer service, and can be re-hung. For added safety and economy, specify Upson-Walton when you need brattice cloth.

Upson-Walton dry-proofed brattice cloth is available in standard and heavy weights.

#### THE UPSON-WALTON COMPANY

NEW YORK

CHICAGO

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Want Facts?

For a copy of "Brattice Cloth Facts", which includes samples of cloth, just send the coupon. The Upson-Walton Company 12500 Elmwood, Cleveland, Ohio Please send copy of "Brattice Cloth Facts".

Your Name \_\_\_

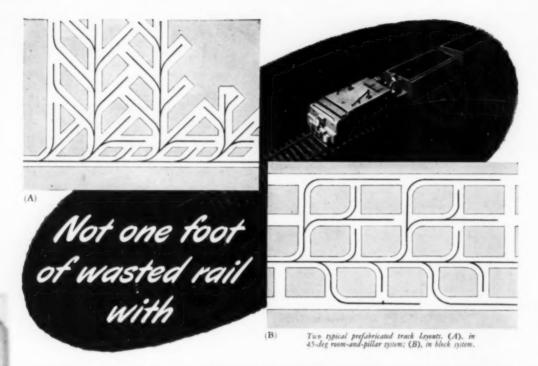
Company

Address ...

City\_\_\_

State

WIRE ROPE . ROPE PITTINGS . BRATTICE CLOTH . TACKLE BLOCKS



## BETHLEHEM PREFABRICATED TRACK

The "no waste" feature of Bethlehem prefabricated track has always appealed to economy-minded operators. Today that feature is even more important to the mine executive, who must stretch his limited supplies of rails and trackwork to the utmost.

When the customer cuts and curves his own rail, he often has from 5 to 10 pct discard that goes into the gob pile. He avoids all this waste when he purchases Bethlehem prefabricated track. The rails come

to him precut to proper lengths; precurved to proper radii; all ready to install.

How is this possible? Because the track layout has been planned for him ... planned in advance ... by Bethlehem engineers, whose job is to tailor the layout to the individual mine.

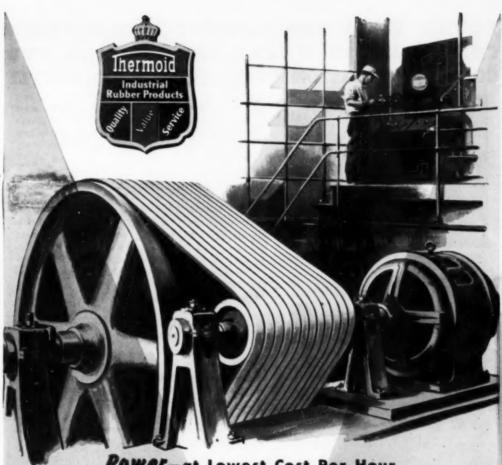
Thus, in three different ways, Bethlehem prefabricated track offers substantial savings: no rail waste, no cutting or curving in the mine, no customer engineering. But there's a fourth and equally important economy—saving of installation time. Trained, experienced track crews are not required. A little supervision is essential, but even green track men can easily install a Bethlehem prefabricated system. It's almost as simple as putting together the track for a toy railroad.

Why not let us supply you complete details? One of our engineers will be glad to call at your request. Write or phone our nearest office.

#### BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation Export Distributor: Bethlehem Steel Export Corporation





## **Power**—at Lowest Cost Per Hour with Thermoid Multi-V Belts

Thermoid Multi-V Belts are pre-stretched to insure maximum power transmission without adjustment. They are constructed for flexibility and ability to absorb repeated shock loads ... thoroughly impregnated with special rubber compounds to withstand moisture and abrasion, resulting in longer belt life.

Thermoid Multi-V Belts are available in matched sets—uniform in size and cross section. Their longer life and non-slip performance add up to "Power—at the lowest cost per hour."

Your Thermoid Distributor can help you with your power belting problems—whether you need Multi-V, F.H.P. or flat transmission belts. For unusual belt problems, a Thermoid Field Representative is always available to give you the benefit of his experience.

Conveyor & Elevator Belting - Transmission Belting F.H.P. & Multiple V-Belts - Wrapped & Molded Hose



Rubber Sheet Packings - Molded Products Industrial Brake Linings and Friction Materials

Thermoid Company · Offices & Factories: Trenton, N. J., Nephi. Utah

## YOU'LL FIND THE LOWEST PRODUCTION COST PER TON WHERE COAL MINING AND COAL PREPARATION OPERATE INDEPENDENTLY



S-D "Automatics" moving over Surge Bin is one continuous, smooth operation, opening and closing doors automatically.



The "Automatic" Drop Bottom car is the only practical method of completely filling a Surge Bin to track level.

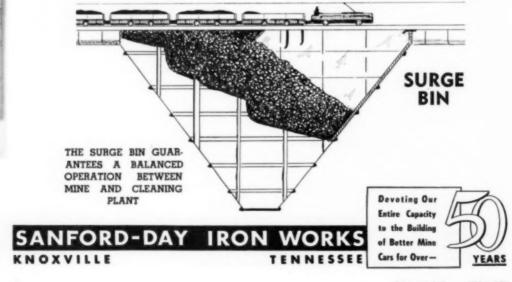
You only have to look around a bit to find the answer to rock bottom production costs of coal. The facts are wrapped up in those mines where mining at the face and the preparation plant can function independently of each other.

The S-D Automatic system of coal transportation from mine to cleaning plant is your guarantee of a continuous, even flow of coal, so necessary to low production costs. This includes an adequate Surge Bin which will serve as a temporary storage of coal in transit... the production balancing point between mine and preparation. This Surge Bin plus S-D "Automatic" Bottom Dumping Cars is essential to the low cost, independent working of mine operation and preparation plant.

Any cleaning plant works best, and at the least cost, with an even continuous supply of coal. The Surge Bin continues to supply coal to the preparation plant when, for any cause, there is a delay at the face.

With an adequate surge bin, one shift operation of cleaning plant is often sufficient to take care of two shift operation of mine. Breakdowns or delays at the preparation plant need not stop mine production because the surge bin will take the coal until repairs are made.

For additional facts and details, phone H. W. Sanford, Jr., Sales Manager, 3-4191, Knoxville.



## SAVE METAL! CUT YOUR MAINTENANCE COSTS ABOVE GROUND AND BELOW!

STOP RUST!

#### So Easy To Use That One Man Often Does The Work of Two

Indoors and out, above ground and below—RUST-OLEUM stops rust on your pipes, cars, metal sash, tipples, machinery and surface equipment! Saves time, labor, and money because RUST-OLEUM may be applied directly over rusted surfaces after wirebrushing and scraping to remove rust scale and loose particles. Cuts maintenance costs, too, because RUST-OLEUM lasts longer applied over surfaces already rusted. Resists fumes, dust, moisture, rain, snow, and weathering. Beautifies as it protects in all colors, aluminum, and white. Get the facts, today. Prompt delivery from Industrial Distributors in all principal cities, United States and Canada.

RUST-OLEUM CORPORATION

2462 Oakton Street + Evenston, Illinoi

## RUST-OLEUM

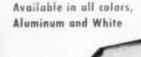
May be applied directly over rusted surfaces without removing all the rust!



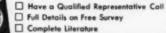




Look for this label -- be sure it's genuine RUST-OLEUM







☐ Nearest RUST-OLEUM Source



- · No welding
- · Use it over and over
- For temporary or permanent trackage

Drill a hole, insert the wedge and pound it home. That's all you have to do to get permanent, low-resistance joints when you use the Wedge Type Tigerweld Rail Bond.

To remove the bond—and re-use it—just knock the wedge out from the other side. The bond comes off easily. With just ordinary care, the Wedge Type Tigerweld Bond can be re-used indefinitely. And many mines use it for permanent trackage as well.

For more information on these long-life, troublefree Tigerweld Bonds, write American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.

AMERICAN STEEL & WIRE DIVISION,
UNITED STATES STEEL COMPANY
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAIN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
WHITED STATES STEEL EXPORT COMPANY, NEW YORK





U-S-S American Tigerweld Rail Bonds

UNITED STATES STEEL

## New Mines from Old!

remarkable new source opened up by

CARDOX-HARDSOCG

Surface AUGER MINERS

An exposed face of coal which has already been stripped to the economical limit can now be reworked with an AUGERMINER to pay big returns. Costs were presumably covered the first time over. New costs, after a Cardox Hardsocg AugerMiner has quickly paid for itself will be low in comparison which means a highly profitable operation.



The portable unit is trucked up to the face as shown above and positioned to drill horizontally into the seam. Coal comes out in a continuous mechanized flow, which can be loaded automatically by portable conveyor iste a waiting truck. Additional

augers are added and coal can be drawn from as far as 100 feet beyond the face. No shoring is required, since ample support for the overburden is given by the "columns" between holes.

#### Good Clean Coal

Augers are directed directly into the seam proper and, without disturbing rock or shale, bring out only coal. This is freer of impurities than the first working of coal from this seam—a better product at a fraction of the cost.

There is an AUGERMINER in the complete Cardox-Hardsocg line exactly suited to your needs. Let us give you full details about it.



Hardsocg Division • CARDOX CORPORATION • 307 N. Michigan Avenue, Chicago 1, Ill.

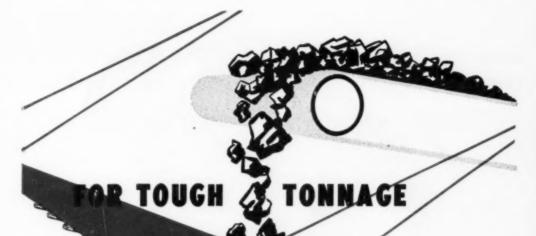
THIS IS THE POINT WHERE PROFITS BEGIN

YOU'LL FIND YOUR GREATEST ECONOMY IN BOWDIL BITS

HELD BY THE LONGEST LASTING CHAIN

. . . . . ON THE STRONGEST CUTTER BAR MADE





#### Fomocord CONVEYOR BELL

We pay more for Homocord, but it costs us less!" • That's what users say . . . and they won't take any other conveyor belt. It makes sense, too. Where tonnage is toughest, Homocord has been known to outlast 2 or 3 ordinary conveyor belts. Figure cost of belts, plus cost of repeated installations, and Homocord proves the biggest bargain you can get • Its special construction—cushioned and flexible—absorbs impact that other belts can't take. Send for Bulletin 6906 and read about the Guillotine Test that proves our point • The same engineering goes into our hose, V-belts and flat belts. Get your Manhattan representative to show you.



MANHATTAN RUBBER DIVISION - PASSAIC, NEW JERSEY

#### RAYBESTOS - MANHATTAN, INC.

















of Belts V-8

V-Belts Com

Conveyor Belts

Hose

Roll Covering

Yank Lining

Abrasive Wheels

Other R/M products include: Indivistrial Rubber • Fan Belts • Radiator Hose • Packings • Broke Linings • Broke Blacks
Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls



Sinclair Litholine

in wheel bearing tests

heavy-duty mobile equipment. Sinclair LITHOLINE® Multi-Purpose Grease has been proven an outstanding heavy-duty wheel bearing lubricant in exhaustive year-round tests.

One test was made in a Mid-West city bus line. An inspection after 20,000 miles showed the bearings were smooth and well-lubricated. There were no signs of scratching, pitting, heat spots, gum or varnish. Sinclair LITHOLINE's original character was well-maintained - there was no slumping in the bearing or housing, no softening or liquefying, no separation and no leakage through seals.

This safe, sure lubrication of one of the most vital points of heavy-duty mobile equipment . . . and its outstanding performance at all other lubrication points . . . prove that Sinclair LITHOLINE is a real multi-purpose grease . . . winter and summer.

Send for a free folder describing demonstrations of the superiority of LITHOLINE. Contact your local Sinclair Supplier or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

for every grease lubrication job... SINCLAIR LITHOLINE



WOW a complete line of Bits and Rods for drilling Mine Roof more efficiently



KENNAMETAL

"Better Bito for Harder Work!"

#### KENNAMETAL ROOF DRILLING

## Proved to give 10% to 15% faster Penetration



#### STYLE RD FOR DRILLING SHALE, SLATE... other similar materials

A variation design of the regular Kennametal coal bit adapts the Kennametal Style RD Bit to give exceptionally fast drilling speed in mine roof consisting mainly of shale, and slate. For this type of drilling it operates faster than either the Kennametal Style HFD or the Kennametal Rock Bit and offers minimum actual bit cost for drilling roof. It gives a smooth non-rifled hole, is easy to collar, and requires only a

minimum of pressure. The design differs from the Kennametal coal bit in that it has shorter and heavier prongs. The Style RD is available for wet drilling (with water channeled shanks) on special order. The outstanding features of the Style RD Bit is its ability to drill faster than other bits for roof bolting, give low bit cost per foot, and require a minimum of conversion in equipment for efficient roof bolting.



#### NEW STYLE KENNAMETAL HFD BIT for the fastest drilling of Medium Roof

Kennametal Bits are AHEAD in engineering design features to enable you to make big savings in production cost NOW. They are designed for faster drilling speed, with correspondingly longer life than any other tungsten-carbide bit. In this design the "Breaking" point or point of zero velocity in the center of the cutting edge is CUT OUT. This allows it to drill as fast as material and machines permit. Another exclusive feature of the Kennametal HFD is that it can handle a flow of water to the cutting edge, giving it longer drilling life,

and immediate adaptability at no extra cost where wet drilling is done. Hollow-centered Kennametal Rods (note opposite page) permit the flow of water from the drill. Because of its long cutting tip of solid Kennametal tungsten-carbide it drills longer footages, gives maximum resistance to gage wear. Think of these features when you think about increased roof drilling efficiency. They are EXCLUSIVE features of Kennametal bits — the only tungstencarbide bit for practical rotary drilling of materials as hard as laminated sandstone.



#### KENNAMETAL "THREE-POINT" ROCK BITS for Stoper Drilling Mine Roof

One of the outstanding advancements in rock bit design is the development of the three-point rock bit. It is the only bit that utilizes all the advantages of the multiple-point bit, such as easy collaring, freedom from wedge action, and straight holes in fissured rock, yet its drilling speed approaches that of the chisel type bit—the design that gives the fastest possible drilling speed. It has fewer cutting edges which give it 10% to 15% greater drilling speed than other multiple-point bits, it has more clearance for cuttings, more ports (that are

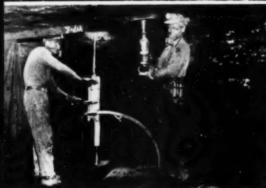
less apt to clog due to their position in the face of the bit), it operates at any air pressure, and won't wedge in drilling materials of a soft nature such as clay, soft limestone, slate, and shale. For the best allaround drilling efficiency, the Kennametal PT design is the outstanding bit for the stoper drilling of mine roof. It is the bit for massive limestone and sandstone in the line of Kennametal Bits which offer exclusive design features, to give maximum drilling speed, long bit life, and low cost for ANY roof bolting job.

IN THE DESIGN OF CARBIDE BITS

# .. Designa of Tomorrow Proved to be 'way lower in cost, easier and safer to use







#### KENNAMETAL ROOF PINNING RODS

... offer the unobstructed removal of cuttings when roof bolt holes are rotary drilled. They are lighter than regular augers, less bulky, easier to handle, and both the Style RD and the Style HFD Bit fit them.

A special hollow steel rod is used for wet drilling that is similar in design to the steels used in rock drilling. Shank styles are available to fit the sockets of the more popular special rigs used in roof bolting. The Kennametal Roof Pinning Rod is another of the outstanding designs originated by Kennametal for the most efficient drilling of roof bolt holes. No other pinning rod can equal the service life of the Kennametal Rods under severe service conditions.



First in the development of Tungsten Carbide bits for cutting coal, drilling coal, drilling rock and mine roof

#### IT'S SAFER TO BOLT ROOF WITH KENNAMETAL

The faster operation of Kennametal tools in roof pinning enables jobs to move faster, the key bolts to be installed sooner. Safety and efficiency go hand-in-hand —that's why it's always better, AND SAFER to use Kennametal.



#### NEW KENNAMETAL MACHINE BIT For Long Cutting Service



The newest and most unusual design to be effected in the past five years in the tungsten-carbide mining machine bit is the new Kennametal Style "R" Bit which can withstand great impact stresses in cutting coal where many impurities exist. The bit is as effective in cutting one seam as another. It cuts fast, easy and can better withstand the repeated impact of hitting sulphur and other tough materials in the seam than the conventional flat insert designs. The style "R" Bit is used on both the continuous type miner and conventional chain machines. Because of its greater shock resistance, it will give longer service life between changes, will withstand more resharpenings per bit life, and therefore give lower bit cost.

#### KENNAMETAL Inc ..

Mining Division Latrobe, Pa., U.S.A.
World's Largest Manufacturer of Tungsten-Carbide Mining Tools



The portable LONG Piggyback—<u>the first and only bridge conveyor</u>—provides the vital link that completes the continuous haulage system from loader to tipple . . . eliminates costly "down-time" waiting for immediate transportation.

Operating as the connecting link between the mobile loader and Room Conveyor, the Piggyback—an exclusive Long development—takes coal out in a continuous, steady stream as fast as it is produced. There's no waiting for intermittent transportation. The receiving end of the Piggyback Conveyor is attached directly to the loading machine and follows it automatically as it moves.

In use, the loader-Piggyback-Long Room Conveyor combination operates as a single machine without any attention whatsoever from the operator. Consequently, he can devote his entire time and energy to operation of the loader. He never has to even look back at the rear conveyor discharge. Further, he

never has to tram coal on the loader or stop for pan-ups.

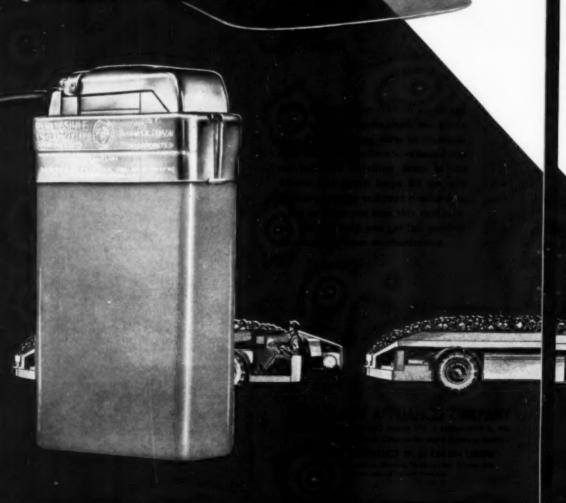
Of particular note is the flexibility and extreme maneuverability of the Piggyback. The two "Wishbone" pivots—one at each end of the Piggyback—provide a pivot action of 180° each. This means the load is centered at all times and continuous haulage can be maintained at a 90° angle breakthrough and in close quarters. The dolly action permits long advances without pan-ups.

Available in two models with rated capacities from 2 to 5 tons per minute, the Long Piggyback System offers the first efficient, economical solution to the problem of true continuous mining!

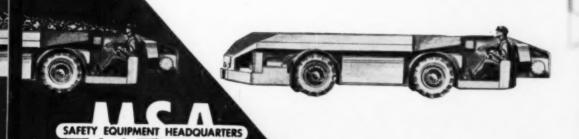


All standard loading machines and continuous miners are adaptable to the Piggyback System

The Light



# that helps fill that *Extra* car



# For Beffer Cores For Beffer Cores Ground Shale Grow You NEED ALL THREE The Model 40-C Diamond Core Drilling Machine This is our latest model; designed to give greatest possible value, not only in first cost but also in low operating

Model 49-C Core Drilling Machine with Gasoline Engine Power Unit and oil operated Hydraulic Swivelhead. Other Models are shown in our bulletins and in our "Mining Catalog" insert.

an electric motor or a compressed-air motor, the Model 40-C has ample capacity for drilling 3" holes (2-1,8" cores) to depths of more than 500 ft. and is equally effect-

and maintenance costs. Modern design, rugged construction, liberal use of alloy-steel parts and anti-friction bearings throughout, permit long periods of trouble-free high-speed drilling under the most difficult conditions.

Powered by either a gasoline engine, a Diesel engine,

#### The Series "M" Double-Tube Core Barrel

Is our successful answer to the problem of getting good cores from Coal, Shale and other soft or broken strata. It differs from other types of ball-bearing core barrels in that the inner tube is equipped with an additional shoe or shell, which extends down as closely as possible to the cutting edge of the bit and completely encloses the core lifter. The core is thus already in this non-rotating extended inner tube when it passes through the core lifter, thereby eliminating the usual tendency to block or grind and assuring a high percentage of core recovery. Further information furnished on request.

ive for drilling to twice that depth, with progressively smaller holes and cores. The swivelhead can be either "Screwfeed" or "Hydraulic", the latter operated with either oil or water. Both types of swivelhead are available in two sizes and can drill at any angle through a full 360 deg. arc. Bulletin 185, fully illustrated, contains complete information and working data.

#### "TRUCAST" Diamond Bits

For use with the series "M" Double-Tube Core Barrel we furnish an extra-long type of "TRUCAST" Diamond Coring Bit, with female thread, which is available in all standard sizes. Other "TRUCAST" Diamond Bits are

available in a wide variety of standard and special types, ranging from 1-1,2" to 7-3/4" in diameter. All bits are set with first-grade African bortz unless otherwise specified and have proved their superiority for years under every possible diamond drilling condition. Write for Bulletin.





#### OR, you can turn the whole Job over to us.

Besides being manufacturers we are one of the oldest and largest contractors for any type of Diamond Core Drilling. This includes exploratory drilling for coal and ore; foundation-test drilling for bridges, dams and other heavy structures; grout holes and pressure grouting. Sixty years of successful experience, superior equipment and ample financial resources assure satisfactory results. Estimates submitted promptly on request.

#### SPRAGUE & HENWOOD, INC.

New York Philadelphia Pittaburgh SCRANTON 2, PA.

See our four-page insert in the current "Mining Cataloge".

#### **BUILD PROFITIME...CUT DOWNTIME-**



T'HAT'S right! You increase yardage and profits and reduce operating cost when your equipment rolls on Firestone. That's just what the Firestone Earth Mover All Non-Skid tires are doing in the illustration above. This tire is engineered and built for free-rolling wheels—for scrapers, wagons, and buggies—equipment on which maximum flotation, frictional traction, and low rolling resistance are essential. And it holds on slopes without side-slipping.

Firestone Tires stand up longer because they are built for the job and they are built to take it. Extra tough, heavy treads give more traction under all conditions. Gum-Dipped rayon cord bodies are reinforced with four extra impact plies and can be retreaded again and again. Tough sidewalls are double-thick and snag-resistant.

Whether it's earth moving, strip mining or rock work, Firestone has the tires and the service that will cut downtime and keep men and equipment on the job. Try them and see for yourself.

#### WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES, SPECIFY FIRESTONE

Enjoy the Voice of Firestone on radio or television every Monday evening over NBC

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Wayne S. Fuhr, Lubrication Engineer Hunna Coal Company, Div., Physburgh Consolidation Coal Co.

#### HANNA COAL CO.

(division of Pittsburgh Consolidation Coal Co.)

WITH Lincoln

#### CENTRALIZED LUBRICATION

SYSTEMS AT THEIR NEW

GEORGETOWN PREPARATION PLANT ...

"We first installed the Lincoln CentrOmatic\* System in the original dry Preparation Plant in January, 1948. Bearing failures have been almost completely eliminated, and the saving, based on previous costs, is estimated at \$20,000 per year. In the new preparation plant our maintenance records indicate a saving of \$32,240 per year in labor alone. We have also saved approximately 45% in lubricant costs and have not had a single bearing failure since the System was installed.

"When construction of our new Preparation Plant was begun in 1949, provision was made for equipping all possible machinery with Lincoln Centralized Lubrication. As a result, most of the 18,000 feet of lubrication line is concealed beneath the floors.

"The three central lubricant pumping and control stations serve (1) the Rotary Dump and Car Haul; (2) machinery on the upper floor of the Plant, including raw coal and refuse handling sections, washers, cones, picking tables, and all subsidiary conveyors; and (3) machinery on lower floor, including all drying and loading equipment, as well as equipment in the table section. To even approximate the results obtained from the Lincoln System, four additional lubrication men would be required, and still the thousands of dollars saved in lubricating materials, production time, and maintenance cost would not have been effected."

Hanna Coal Company
Wayne S. Fuhr, Lubrication Engineer

#### Hanna's 7 Point Lubrication Program for Reducing Operating and Maintenance Costs

- 1. The addition of a Lubricant Engineer to the staff.
- 2. A thorough study of the lubrication problem.
- 3. Establishment of a system for controlling Lubricant Application.
- 4. Standardization of lubricating materials, lubricant application equipment and gractices.
- 5, Simplification of lubrication methods to reduce manual rautine and remove reliance on the human blement.
- 6. Installation of fully automatic, time controlled Lincoln Centralized Systems for mass lubrication, wherever possible, to conserve manpower and insure the positive delivery of the right lubricant, in the right quantity, at the right time to all bearings within a system, regardless of operating conditions.
- Provision of visual control panels to record the frequency with which lubricant is applied in predetermined quantities to all bearings within a system, and to indicate the pressure at which lubricant is delivered to the bearings.

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For additional information on cost-reducing Lincoln CentrOmatic\* Lubricating Systems for the mining industry, write for Bulletin 680.

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LINCOLN ENGINEERING COMPANY . 5729 Natural Bridge Ave., St. Louis 20, Mo.



View of Injectors connected to bearings on Belt Conveyor Take-Up Idlers.



View of flexible supply line to Injectors serving bearings on Rotary Car Dump.



View of the new \$5,000,000 Coal Preparation Plant at Hanna Coal Co., Division of Pittsburgh Consolidation Coal Co.,

Master Control Panel, First four sections of Panel are devoted to lubrication controls, indicators and chart recorders showing performance of lubrication system throughout the plant

Berrenth munimum .

One of three central lubricant Pumping Stations showing dual power-operated pumps, time controls and pressure recorder.

View of Injectors connected by flexible hose to bearings on Raw Cool Shaker.

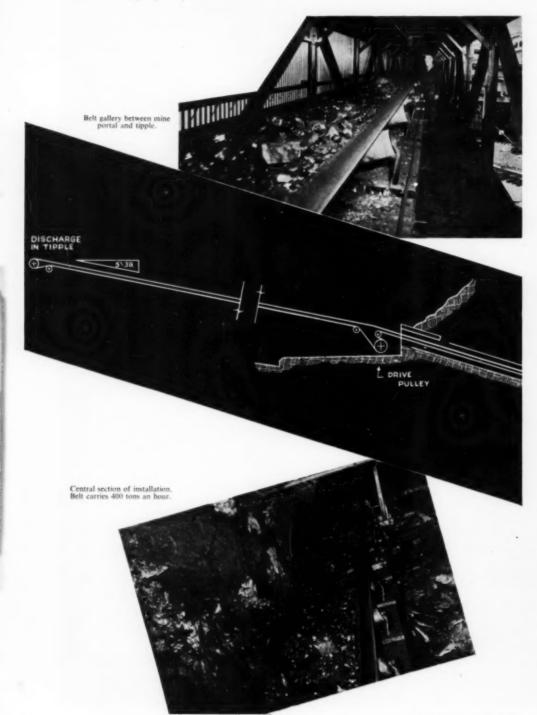
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It is raising 400 tons per hour of bituminous coal a vertical distance of approximately 2½ times the height of Niagara Falls! This U. S. Rubber belt consists of a special fabric which combines Ustex® and nylon to provide the following outstanding features:

High-tensile strength • optimum troughability for true alignment • low stretch • greater resilience for dissipation of shock and impact • superior transverse strength for load support and resistance to ripping and tearing • high strength-weight ratio.

If you have a materials handling problem with coal, rock, ore and other bulky materials, write to address below.



Loading point deep at bottom of slope.



\*No. 3 mine at Evanston, Kentuck

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All the advancements in electrical digging made by P&H have one common purpose - lower tonnage costs.

Here's faster operation with such P&H improvements as Magnetorque\* Hoist Drive, stepless power regulation . . . independent propel for faster move-ups.

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When you put these, and other progressive P&H ideas to work, you're sure of lower tonnage costs in all kinds of open-pit operations.

P&H leads the field in electric shovel developments.

T. M. of Harnischfeger Corporation for electro-magnetic type clutch.



to meet the growing need for copper.



Every third P&H Electric Shovel sold is a repeat order

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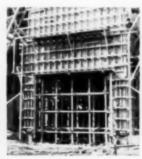
600 tons-per-hour of run-of-mine coal: that's the capacity of this new preparation plant at Peabody Coal Company's Pana Mine No. 17. No matter how big the project, R&S is staffed to handle it—any place in the world, any time you are ready.



This plant was dismantled, moved and re-erected at this new site by Roberts and Schaefer Company construction forces. You can save time, money and headaches by consulting R&S when you contemplate changes in your plant.



Here is steel construction at its best—this enormous bin designed and constructed by Roberts and Schaefer Company for the Blue Diamond Coal Company.



When you see form work like this on a concrete construction project you know it's being done right—the R&S way.



This modern cooling station is an example of R&S design applied to a basic materials handling problem.



This R&S-engineered "shell roof" concrete hangar has 340-feet unsupported span—the longest in the world; Your next project may not require this calibre of engineering excelence, but it is assuring to know that such engineering is available when you need it—and it is an adder guarantee that "conventional" assignments will be handled with complete understanding and competence.



This R&S-constructed preparation plant was so successful in operation that the owner ordered a practically identical plant for another mine. Repeat orders are a natural "by-product" of skilled construction, . . completed on schedule.



Engineering and construction of this coal preparation plant, as well as the manufacture of its air-washing equipment, were all done by Hoberts and Schaefer Company—the whole job, start to finish. Undivided responsibility can cut costs on your next project too.



R&S was selected to construct this preparation plant at the Bureau of Mines hydrogenation project, Louisiana, Mo.



"Install it and see that it works" is the policy at R&S. Installation of equipment is only one of the many Roberts and Schaefer services.



In this instance R&S worked with the plant owner on everything from site selection and development, through engineering and construction of the basic plant and subsequent additions.



Plans move quickly in this engineering department . . . under the supervision of well-known specialists in the field of civil, mechanical, electrical and architectural design.



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# COMPARISON **PROVES** the VALUE of VEELOS the Adjustable V-Belt...

TF you use v-belts you'll be interested in this clear statement of facts about VEELOS, the link v-belt, and endless v-belts.



These 4 reels of Veelos provide up to 316 standard v-belt sizes.

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		111100

# COMPARISON TABLE VEELOS and ENDLESS V-BELTS

## **Veelos V-Belts**

## **Endless V-Belts**

Any length can be provided for any v-belt drive due to link construction

Standard or special lengths must be supplied for individual drives.

INVENTORY

MINIMUM INVENTORY, 4 reels can care for every v-belt need in the O, A, B and C widths. No deterioration or obsolescence of spare belts.

LARGE INVENTORY, 316 sizes are required to provide a complete stock in the O, A, B and C widths. Spare belts not immediately used will

STOCKROOM STORAGE

SMALL SPACE. It takes less than 2 square feet of wall or floor space to store 4 reels of easily identified Veelor

LARGE SPACE. Walls and ceilings are often covered with stocks of endless v-belts. Identifying and maintaining full stocks is difficult and costly.

INSTALLATION

Installs quickly on any drive without resetting motor or tearing down outboard bearings.

Necessary to reset motor and tear down drives with outboard bearings.

MAINTENANCE

Belts can be adjusted or replaced without moving the motor

Sliding or pivoted motor bases are necessary to replace endless v-belts. Belts cannot be adjusted individually.

OPERATING EFFICIENCY

Full power delivery can be maintained because the tension of each belt in a matched set is kept uniform by removing or adding links.

Individual belts cannot be adjusted to maintain uniform tension and provide full power delivery.

DRIVE LAYOUT

No limitations are imposed by belt length.

Limited by the availability of standard or special belt lengths.



If you would like to learn more about Veelos-how it can save you money and keep your machines producing-write today for your copy of the Veelos Data Book. It's free and full of facts!



# MANHEIM MANUFACTURING & BELTING COMPANY MANHEIM, PENNSYLVANIA

# ADJUSTABLE TO ANY LENGTH ... ADAPTABLE TO ANY DRIVE

Made in all widths in three types: regular, oil-proof and static conducting. Also double V in A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.



COMPETENCE

RESPONSIBILITY

ACTION

# GET IT DONE

This favorite expression of WKE management characterizes the aggressive action and persistent follow-through necessary for top performance.

Project management by WKE provides you with experienced personnel and sound organization for design, engineering and construction of production facilities.

In the fields of coal preparation, iron beneficiation and metallic and nonmetallic mining, the WKE insignia stands for competence, responsibility and action — to "get it done" faster and better.

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The men like it, too. It comes in convenient spools; it's light in weight; easy to hook up for main and down-hole lines — just tie a half hitch — and it's safe to handle.

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Also Safety Fuse since 1836

Made in several types. PLAIN PRIMA-CORD for shallow holes and surface trunk lines; REINFORCED PRIMACORD for deep holes and resistance to abrasion; WIRE COUNTERED PRIMACORD for deep, ragged holes; and PLASTIC RE-INFORCED PRIMACORD for deep, we'l holes and river crassings.



The PROVED and APPROVED DETONATING FUSE

FEBRUARY, 1952

IVAN A. GIVEN, EDITOR

# **Audit and Forecast**

NOT SPECTACULAR but nonetheless a good year is perhaps the most-accurate description of 1951 in the coal-mining industry. Anthracite was the big disappointment, with weather again the villain, and candor compels pointing out that bituminous would not have done so well without the upsurge in overseas shipments. Competition continued to push one way, with pressure in the other direction from a faster pace in business activity and rearmament. The net result of the interaction of all these forcesweather, competition and industrial and defense activity—was a set of preliminary production figures reading as follows: anthracite, 41,509,000 tons, off 5.8% from 44,077,000 tons in 1950; bituminous, 535,000,000 tons, up 3.6% from the 1950 total of 516,311,000 tons.

Yearly totals, however, are not a true measure of what was achieved even from the production standpoint. The anthracite rate in the opening and closing weeks of 1951 was an indication that a return to normal weather conditions will mean a substantially higher production level. The picture is even clearer in biruminous, which operated at approximately 10,000,000 tons a week over most of the first eight months and then jumped up to between 10 and 11,000,000 tons for most of the last four. In other words, there was a definite strengthening in the demand for biruminous coal in the closing months of 1951, which augurs well for a considerably higher rate in 1952.

There is more than careless optimism on which to base a forecast for an increase of more than 30,000,000 tons in bituminous production in 1952, and — with some help from the weather — a rise in anthracite output. People have money, the economy is in high gear and all signs indicate that defense production will really get rolling. In addition, competition probably will be no tougher and might well

be easier. Consequently, with the exception of the railroads, gains are forecast all along the line in major consuming areas, with coking, electric power, general manufacturing and exports leading the list. Dissatisfaction, paradoxically, might be expressed only with overseas exports and that only because they must come down and thus will confront the industry with the problem of readjusting its operations to compensate at some future date—perhaps not too soon but nevertheless eventually.

This is not to say there is little but clear sailing ahead. Competition, even though it might not be so severe, is still with us, and a bitter and prolonged contract controversy could knock the most soundly based forecasts into a cocked hat. If the contract is reopened, therefore, a major goal should be prompt and equitable settlement with a minimum of production interruption. All the present indications are that it will be reopened. But granting that a settlement can be reached without controversy, the industry can move into 1952 with a good backlog of improvements in mining, preparation, marketing, public relations and research, with new developments and stepped-up programs promising further help achieving new goals in production.

The final factor in arriving at a better basis for progress is the industry's profit margin. Increasing stress is being laid on this—and rightly so. Without profits, or with inadequate profits, there can be no progress because there are no funds on which to base it. The profit margin reflects not only cost and competition but also management thinking. It is time for the industry to raise its sights as to what constitutes a proper margin. With such a margin, and with continued emphasis on all other tried and proven methods of cutting cost, raising quality and improving service, coal can go forward even faster as the Nation's No. 1 energy source.

# Solid Year in '51 . . . Better Still in '52

Here are the facts and figures on coal and competition in 1951 . . .

PLUS . . . a crystal-ball forecast for 1952 by *The Executives' Forum* 

SOLID YEAR FOR SOLID FUELS—that's the 1951 record.

Production ran smoothly through the year, with no major stoppage and only scattered local shutdowns. Industrial markets picked up strength. And increasing efficiency in mining, especially in bituminous, softened the curse of higher costs for equipment and supplies while an OPS price boost nearly, if not altogether, offset the wage boost miners won in February.

National defense, stacked on top of usual consumer-goods output, was the big wheel in the bituminous upsurge. Demand soared for more electric power, steel and chemicals and, as record incomes jingled in citizens' pockets, more comforts, goods and services. The only place where bituminous lost substantial tonnage was the retail market.

Anthracite was down because in warm weather people don't burn much coal and don't fill their basement bins. A warm spring and a late-starting winter in anthracite's market area hurt. For the same reason, bituminous suffered in that segment of its market.

Profits-wise, 1951 left much to be desired. Federal controls froze mine prices very close to 1950 levels, narrowing the profits margin of many companies or putting them in the red.

Even so, coal companies kept on investing in equipment and machines to raise efficiency, and in new mines to replace old workings and serve growing markets. They spent some \$175- to \$200,000,000 for capital im-

# New Mines for Bituminous Opened in 1951

(Capacity Over 500 Tpd)

	Number (tons)	
	Number	(tons)
New deep mines	21	62,800
New strip mines	. 14	24,250
Deep mines closed	32	59,225
Strip mines closed	. 1	1,500
Net gain, 1951 over 1950		26,325
Source: Keystone Coal	Buyera	Manual.

provements; about \$350,000,000 for materials and supplies.

Mineworkers did pretty well financially, with a wage hike at the start of the year and high weekly earnings as the year moved on. On the whole, they carried their share of the fight to keep the industry on top of its cost problem. Aided by operators' investments and spurred by operators' programs to tell them about their industry and their company, bituminous miners boosted tons per man-day significantly. In anthracite, with mining conditions that grow more difficult every year and without machines tailor-made to the industry's needs, miners did well to keep productivity at 1950 levels.

Low productivity was the reason for anthracite's growing dependence upon stripping. There was no real surprise in the fact that strip mines produced a record percentage of anthracite in 1950. There will be no surprise if, in 1951, the final figure is higher still. In bituminous, stripping probably contributed no more than in 1950.

# Facts About Coal

# Facts About Coal's Workers

	1951	1950		1951	1950
BITUMINOUS			BITUMINOUS		
Production, tons	535,000,000	516,311,053	Employees.	372,000*	415,583
Per cent stripped	23 5	23.9	Avg. weekly earnings		\$70.3
Value at mine, per ton	\$4.85	\$4.84	Peak weekly earnings		\$78.75
Mechanically loaded underground,			Avg. hours per week	34.6*	35.0
per cent	55.0	52.8	Tons per man-day	7.20†	6.7
Mechanically cleaned, per cent	40.0	38.5	ANTHRACITE		
Stocks, Dec. 31	78,000,000	78,722,997	Employees	66,300°	72,624
ANTHRACITE			Avg. weekly earnings		\$63.24
Production, tons	41 500 000	44,076,703	Peak weekly earnings		\$80.01
		26.8	Avg. hours per week	29.2*	32.1
Per cent stripped			Tons per man-day	2.89†	2.83
Value at mine, per ton	\$9.00	\$8.90	* Through September. + Estimated.		
Data for 1951, estimated; 1950, Burea	u of Mines.		Sources: Bureau of Mines; Bureau of Labor	Statistics,	

# Cost-Price Squeeze Hits Profits

	Per-Share Earnings			Share
19.	51 1950		1951	1950
SECOND QUARTER		Pittsburgh Consolidation Coal Co	1.30	1.32
Peabody Coal Co Los	\$0.28	Truax-Traer Coal Co	0.87	1.10
Truax-Traer Conl Co	14 0.72	United Electric Coal Cos.	0.77	1.10
FIRST 6 MONTHS		FIRST 9 MONTHS		
Clinchfield Coal Corp		Lehigh Coal & Navigation Co	0.56	0.95
Glen Alden Coal Co Lo				
Island Creek Coal Co	93 1.77	Pittsburgh Consolidation Coal Co.	4.11	4.28
Lehigh Coal & Navigation Co 0.3	36 0.49	Pond Creek Pocahontas Coal Co	5.24	5.69
Pennsylvania Coal & Coke Co 0.5	90 0.15	West Kentucky Coal Co	1.94	3.16
The Pittston Co	83 1.35	West Virginia Coal & Coke Corp.	1.60	2.65
Pond Creek Pocahontas Coal Co 3.4	43 3.79	West Virginia Coat & Coke Corp.	1.00	2.03
West Kentucky Coal Co 1.3	35 2.19	SIX MONTHS ENDING OCT. 31		
THIRD QUARTER		Peabody Coal Co.	0.08	1.11
Peabody Coal Co	34 0.82	Truax-Traer Coal Co	1.01	1.90

# Outlook for Demand and Profits in 1952



FRANK F. KOLBE, President, The United Electric Coal Cos.

Coal mining was the only basic industry which was not called upon to produce at full capacity during the year 1951. Other basic materials, because of the war effort and commercial demand, had a call for more of their production than they were able to supply.

In spite of this, about 80% of

the coal-mining capacity of the United States was utilized and fair profits were made generally throughout the coalmining industry.

The defense effort so far has not had any marked effect on the demand or increased the price in various coalproducing districts over the United States. It is expected that this will be felt to a more definite degree during the calendar year 1952.

Increase in export demand and larger tonnages for public utilities in 1952 are definitely expected. This should reflect an increase in the total production over the country and a slight increase in the price return for this basic commodity.

# Coal's Big Customers

UTILITIES, STEEL AND RAIL-ROADS-how did coal fare with these customers in 1951?

The utilities and steel used more coal than ever before; the railroads, less.

More coal under utility boilers was balanced by a decline in oil consumption, while natural gas use moved up considerably. The trend to coal was signaled in January, when Consolidated Edison, New York City, returned to coal. Other utilities followed. Figuring in the picture was an over-all increase in power generation, with monthly kilowatt-hour output running from 11.3 to 16.7% ahead of 1950.

The figures on the coal burned, plus known utility plans for growth, look like the start of a vastly enlarged market for coal. For instance, TVA in September contracted for 27,795,000 tons of coal to be delivered to six steam plants now operating or under

construction. The contracts run for periods of 10 mo up to 10 yr. TVA estimates that by 1956 it will be using 13,000,000 tons per year against some 900,000 tons in 1950.

Close by the new atomic energy plant near Paducah, Ky., five private utilities have started building at Joppa, Ill., a big electric plant to supplement TVA power. The Joppa plant will burn 2,000,000 tons per year. Meanwhile, Congress has authorized three 100,000-kw steam plants to fill the hydro-power gap in the Pacific Northwest.

Those are the big guns of utility expansion. Add in the lesser guns and you get a drumfire that means fast advance for coal. For instance, the Aluminum Co. of America has contracted with Texas Power & Light Co. for a lignite-fired power plant that will use 7,000 tpd of solid fuel. This may well be the start of a trend that will bring more coal into aluminum pro-

duction. And in the Southeast, nearly 100 power plants—some small and some big, some for utilities and some for manufacturing and processing plants—were completed in 1951 or set for completion by 1953. They will burn coal or coal equivalent totaling over 20,000,000 tons per year.

Steel also looks like a bigger market for the years ahead. The industry is growing fast. It produced 104,000,000 tons of steel in 1951. For 1952, the goal is 113,000,000 tons; by 1953, 130,000,000 tons. With 1¼ tons of coal per ton of steel, that's big business for coal.

Class I railroads cut their purchases of coal in 1951 and increased their take of liquid fuels. But the railroad outlook was not altogether bleak. With increasing loads of defense goods, the railroads faced a shortage of motive power. That's one reason why you had a hard time getting the cars you needed in 1951. It's also the

# Coal and the Railroads

	1951	1950
Coal used, tons	49,700,000*	54,799,499
Liquid fuel used, bbl		98,041,350
Locomotives on order:		
Coal steamers	211	16:
Diesels	1,719†	1,624:
Electric	21	41
Passenger train-car miles, per cent:		
Dieseis	63.55	57.3
Coal steamers	17.05	22.7
Gross freight-ton miles, per cent:		
Diesels	54.25	44.1
Coal steamers	34.9§	42.6
Sources: Assn. of American Railroads; Interstate Comm	erce Commission	
• Estimated + Nov. 1 + Dec. 11   4 Sept		

# Steel and Coal

	Steel Output (Tons)	Coal Needs (Tons)
1950	96,836,075	110,714,000
1951	104,000,000*	125,000,000*
1952	113,000,000†	140,000,000†
1955	130,000,000†	160,000,000†
* Estimated.	† Predicted.	

# **Fuel for Electric Utilities**

	1951	1950
Coal, tons	107,500,000	91,865,978
Oil, bbl	61,500,000	75,287,618
Gas, Mcf	770,000,000	627,978,581
Data for 1951		1950, Federal

reason why the New York Central R. R. began rebuilding some of its retired coal burners. The NSRB took the same line of thought in warning the railroads not to scrap any more of their old steamers lying around in graveyards. They might be needed to move defense goods.

Meanwhile, the Norfolk & Western

Ry., one of coal's loyal friends, stood by the industry. It reported that its 100% coal-steamer operations cost less than those of railroads burning diesel oil and backed its faith in coal by ordering 15 new coal-burning switchers on top of 15 recently completed. The N. & W. also started building six heavy-duty freight steamers. On the whole, the feeling persisted that coal's railroad market is nearing rock bottom. From now on, with the oldest coal steamers weeded out, with modern coal-burners performing well and with the coal-burning gasturbine locomotive looming on the horizon, coal's railroad market has a fair chance to move up.

# Coal for Heavy Industry--Railroads and Utilities



A. E. STODDARD, President, Union Pacific R. R.

The Union Pacific R. R. during the year 1950 consumed for all purposes 3,582,138 tons of coal. For the year 1951 (December estimated) the consumption was 3,938,641 tons. The estimated consumption for 1952 is 3,750,000 tons.

The consumption of coal by all railroads in the United States

for the first 9 mo of 1951 is reported to have been 42, 037,865 tons; for the same period of 1950, 47,109,125 tons. This is a reduction in consumption of about 10.8%. The coal consumption by electric-utility power plants

for the first 10 mo of 1951 was 86,366,107 tons, and for the same period of 1950, 73,753,570 tons, or a gain in consumption of approximately 17.1%.

It is, of course, a well known fact that new locomotives ordered by railroads during the past few years have been preponderantly diesels. This trend is continuing.

This would indicate a continued decrease in consumption by the railroads until such time as coal-consuming power is perfected that will compete with the diesel and electric locomotives.

Present trends indicate that an added number of coalburning steam utility plants will be necessary in all parts of the United States.

With the tremendous coal reserves in the United States, it appears that coal for a great many years will be the basic source of fuel energy.

# Coal for Heavy Industry--Power and Steel



STUYVESANT PEABODY JR., President, Peabody Coal Co.

As the impact of the defense effort is felt by heavy industry throughout the United States, I believe that there will be an increase in the market's demand for coal, principally by the steel industry, the backbone of our defense production, and by the power industry, which is basic to our national defense. These industries are the principal ones which will require more coal in 1952 than in 1951.

Additional factors which, in my opinion, will increase the demand for coal in 1952 are: (1) less new steel available for pipelines, which will decrease inroads of gas on the coal industry, and (2) the fact that export estimates range as high as 72,000,000 tons, a considerable increase over 1951.

The need for coal by users other than those mentioned above should remain about the same as it was in 1951. I believe unquestionably that the coal business from the standpoint of the producers will be better in 1952.

# How Gas Grew, 1950-51

	1951	1950
NATURAL GAS		
Utility sales, M therms	44,421,000*	38,499,900
Customers†:		
Residential	15,760,000	13,783,000
Commercial	1,324,000	1,180,000
Industrial	64,000	56,000
MANUFACTURED AND M	IXED GAS	
Utility sales, M therms	3,359,200°	3,500,300
Customers†:	-10.000	.,,
Residential	7,903,000	8,764,000
Commercial	537,200	592,800
Industrial	43,100	44,200
* Estimated, American Gas Assn. 1		101

# How Oil Fared, 1950-51

	1951*	1950
Crude output, bbl	2,242,000,000	1,971,845,000
Daily demand, bbl.	7,321,000	6,627,000
Imports, daily avg.:		
Crude, bbl	513,400	486,900
Refined products, bbl	343,800	360,000
Exports, daily avg.:		
Crude, bbl	82,900	95,300
Refined products, bbl.	334,100	208,800
Wholesale price index  * Estimated.  Data for 1950: Bureau of Mine	120	5 117.8

# Coal's Big Competitors

OIL AND GAS came through 1951 in good style, but not without their share of irksome troubles.

t End, faurth quarter.

The Iranians, chasing the British out of the oil fields in Iran and the big refinery at Abadan, precipitated a scramble for new oil sources. Rising nationalism elsewhere in the Middle East warned other oil interests that they too may have to look to other suppliers or boost prices to provide the higher profits sought by small nations.

The oil industry covered the Iranian deficit creditably. But with tight supplies, pressure to lift prices mounted. At the same time, costs increased all along the line from field to filling station. The OPS increase of 16 to 31c per barrel along the Atlantic Seaboard was not enough, and New England fuel dealers in October pleaded for higher prices.

Lacking steel to drill enough new wells and serve more markets, oil men grew uneasy about supplies. They left little doubt that if defense gains speed or war breaks out, somebody will get hurt.

Petroleum imports increased in 1951. The big jump was in crude,

which threw an added burden on overworked refineries. Exports likewise moved up above 1950, mostly refined products, which rose about 66% above 1950. The Nation's oil balance, reflected in import-export data, was a deficit of about 450,000 bbl per day, against 543,000 in 1950.

Natural gas, like petroleum, suffered from the steel shortage. That, plus the fact that some gas companies were overplaying their hands, brought a change of mind in the FPC. In September, finding that contract commitments already outstripped sales capacity, the FPC allocated distribution of gas by Panhandle Eastern Pipe Line Co. and denied that company's request for permission to ship gas to Canada. In November, the FPC forbade use of natural gas at TVA's Johnsonville plant. Earlier, in July, a federal judge had delayed the entrance of gas into New England by denying the emergency the gas company

In addition, the gas industry found it harder to attract new venture capital to finance its growth.

Natural-gas customers took warning from developments in 1951. Early in the year, the Texas legislature debated a bill to limit out-of-state shipments and lift field prices. In April, the U. S. Supreme Court upheld the Oklahoma legislature in fixing wellhead prices. As the year ended, the FPC held a score or more of pleas for increases ranging from 16 to 50%, totaling nearly \$110,000,000 annually in added costs to customers.

In some cities, there was no promise that deliveries of gas would be any better than in 1950 or 1949. To mention only one company, Louisville Gas & Electric Co. in November, citing the inability of Texas Gas Transmission Co. to complete its 1951 program, warned customers of a serious gas shortage this winter even if the weather is no colder than normal. The company told industrial and commercial users that they "undoubtedly" would be asked to curtail or even suspend gas service more often and for longer periods than last winter.

Even so, natural gas made good headway in 1951—some of it at coal's expense. It reached virgin markets in all regions and became a more vigorous competitor not only for coal but also for oil.

# Coal and Defense

THE SPEED-UP IN DEFENSE gave a firm tone to markets in 1951. If it brought problems, it also brought helps in solving them.

Here's what the government did to bolster coal:

- In January, the NSRB urged railroads not to abandon their coal steamers.
- 2. In February, the Munitions Board asked all defense establish-

ments to make coal their No. 1 choice among fuels.

- In midsummer, the OPS raised fuel-oil ceilings in the hope of luring industries to coal.
- The government de-mothballed a substantial number of bulk cargo vessels to haul coal to Europe.
- Government officials urged summer fuel fill-ups.
  - 6. DSFA, working with industry

committees, helped obtain needed materials and equipment. The Coal Defense Committee helped plug other gaps.

7. The new tax law lifted coal depletion rates to 10%.

The other side of the coin was not so bright. Here's why:

- Steel and other metals were hard to find.
- 2. Railroad cars ran short as much

as 5,000 cars per month. A motivepower shortage often delayed haulaway of full cars and return of emp-

3. Though OPS partly offset the miners' wage increase, that agency of supplies and equipment.

4. Taxes took a bigger bite out of profits and, with inflation, weakened some companies dangerously and shoved others into the red. As the

made no adjustment for spiraling costs year ended, the profits outlook grew darker, with NCA warning that prices must be raised to keep coal strong.

> 5. The ICC granted a 6% freightrate increase over the protest of coal and allied interests.

# Coal for the Home

IN THE RETAIL MARKETS, coal could have fared better.

The reasons for weakness aren't hard to find. They are:

- 1. The inroads of natural gas, piped long distances and sold on coal's doorstep everywhere-along the Atlantic Seaboard, in the Appalachian district, the Southeast, the Midwest and the Rocky Mountain area.
- 2. Customer indifference to summer and early-autumn fill-ups, bred by three successive warm winters.
- 3. Plenty of money in fuel customers' pockets, enabling them to pay premium prices for oil and gas.

As far as bituminous is concerned, the USBM data on retail-dealer deliveries aren't an exact index of tons that go into home basements. A lot of coal that doesn't show in these figures moves straight from tipple via private truck into home bins, especially farm homes in the Midwest.

Even so, the home-fuel market was the scene of a tough battle. If coal had not strengthened its retail foundations in past years and fought long and hard in 1951, the year might have been even worse.

Here's what the industry did in 1951 to keep coal in homes:

NCA's Coal Heating Service fought with tested strategy and branched out in new directions.

On new frontiers, CHS started Plan 3, an informal pattern for producerretailer effort in small towns, and announced that it would provide newspaper advertising services for non-CHS retailers.

Along tested lines. CHS at midvear reported a membership of 87 retailer groups serving 300 communities and representing 15,000,000 tons per year. The organization worked locally with manufacturers in promoting heat-control sales; circulated a new film. "Your Business Begins in the Customer's Basement," among retailers; published a driver-training manual; and put its Step-Up Sales Training Program to work among over 1,000 retail dealers and salesmen. In 1951, 68 coal-shipper companies and 11 retail groups joined CHS in distributing sales-promotion materials among retailers.

The Anthracite Institute meanwhile spurred sales and promotion.

The Institute showed anthracite burning equipment with a traveling display that stopped in 30 cities; televised Norman Brokenshire's weekly homemakers' show on a 12-station network; sped advertising to anthracite's market area; published a periodical bulletin to help retailers; and continued to test burning equipment and certify it, if it met standards, with a seal of approval.

Anthracite producers pitched in to bolster the Institute's drive with their own television, radio, newspaper and direct-mail advertising and with helps for their own dealers in many cities.

Did sales promotion help? The answer is "Yes." Coal fought

off major market losses and, in some areas, actually won new customers. For instance, through CHS, bituminous was built into 200 low-cost houses at Superior, Wis. As for anthracite, new market prospects opened up in the Midwest.

Rock-bottom therefore is the word for coal's retail markets in 1951. The year ahead can't be much worse, and it may be much better.

Here's why you can feel better about 1952:

- 1. Natural-gas growth is slowing down. The FPC is working over natural-gas claims with a jaundiced eye and a tart tongue.
- 2. Natural-gas price increases are sure as sunrise. Even luxury-minded fuel users may balk at increases of 25 to 50%.
- 3. Fuel-oil prices can move only one way-up. That's because oil is moving in greater quantities to de-fense activities and there'll be less for homes, and because fuel-oil dealers are squeezed between price ceilings and costs
- 4. Reflecting the trends previously noted, shipments of residential oil burners and warm-air gas furnaces declined in 1951 while coal-stoker sales pretty well held their own. In fact, the Anthracite Institute reported that through July, sales of automatic anthracite equipment were 50% above 1950.

# Anthracite in 1952--Problems and Needs



C. M. DODSON, President, Locust Coal Co.

The consuming public in the anthracite-burning area continues to have an almost faddish inclination to be "up to date" with oil or gas. Anthracite industry efforts have failed so far to bring about any discernible change in this attitude.

How serious the inroads of these two competitors will be during 1952 depends largely on whether or not any governmental restrictions are placed on the use of these two fuels. Gas looms the more threatening of the two.

Economy in summer fuel buying seems to have lost its appeal to householders during the prolonged period of inflation. During the coming year more than ever before, this will necessitate larger stockpiling of anthracite at the point of production and in retail yards.

Unless serious efforts by large producers can influence the policy of European buyers away from the relatively scarce sizes, increased exports abroad will seriously disrupt the historic distribution of sizes in our home market. 5. There are many more people in the United States now than 2 yτ ago. Even then, the census showed nearly 15,000,000 homes heated with coal—about half of the homes in the Nation. With this solid base, with more people coming on the scene, and with more families emerging and more houses being built, coal can look ahead with confidence to a better retail market.

# Coal and Home Heat

	1951*	1950
BITUMINOUS:		
Retail-dealer deliveries, tons	75,000,000	86,604,000
ANTHRACITE:		
Production	41,509,000	44,076,703
HEATING EQUIPMENT, SHIPMENTS		
Stokers, Classes I and II	18,900	19,635
Residential oil burners and units	670,000	879,016
Warm-air gas furnaces.  * Estimated. Data for 1950: Bureau of Mines: Dept. of Com	415,000	596,783

# Peace on the Labor Front

A YEAR OF LABOR PEACE—that was coal's story on the national scene. Locally, violence broke out in some regions when the union launched a vigorous organizing drive.

In January, the wage agreement of March, 1950, was amended by adding \$1.60 to the basic wage scale and upping the daily rate of \$16.35. A second amendment at the same time advanced the reopening date to March, 1952. The WSB approved the pay hike immediately before the general wage freeze took effect.

In most circles, it was felt that the industry had gained by its conduct of wage talks. The negotiators reached agreement quietly, without public feuding. Joseph H. Moody, president, Southern Coal Producers' Association, said, "We were especially anxious that the negotiations have as little of the public spectacle as possible in contrast to previous negotiations."

A full report on the mineworkers' welfare fund, issued in the fall, showed that on June 30 the fund was

operating on a sound basis with a comfortable surplus of close to \$100,-000,000. The fund, it was announced, will lend money to private non-profit agencies for building hospitals in 10 mining communities in the next 3 yr. Meanwhile, union officials suggested that a merger of the bituminous and anthracite funds might be a good thing.

But sweetness and light didn't rule everywhere. Organizing drives in Western Pennsylvania, Ohio, West Virginia and Kentucky produced some overturned trucks, shutdown mines and bloody noses. In January, the NLRB found the union guilty of unfair labor practices in West Virginia and Kentucky. Later, in June, the NLRB ordered an end to violence in organizing efforts among Pennsylvania miners.

Some hope was held out for an end to outbreaks of violence when, in November, UMWA international officers wrote to local and district officials requesting an end to wildcat stoppages. Their letter pointed out that grievance machinery is set up in the contract and that unauthorized shutdowns are hurtful to miners and industry.

Operators themselves fostered good will among their workers. After polling miners on their puzzles and preferences, Stonega Coke & Coal Co. launched a magazine geared to workers' interests. Philadelphia & Reading Coal & Iron Co. continued to issue periodic leaflets to workers, their families and townspeople. The leaflets laid facts on the line. One, for example, told miners that across the board the company's deep mines were losing money and that the miners must choose between higher productivity and shutdown. The same company, at midvear, started up a servicepin program to mark miners with longterm service records. Other companies as well, through all media at hand, sought new ways to tell their miners the economic facts of coal mining and the interesting facts about the company and its people.

# **Making Mining Safer**

SAFETY-WISE, coal companies and operators' associations, mineworkers' groups and state and federal agencies pushed hard for better records.

Stellar safety event of 1951, capping a series of district and state contests, was the big contest in October at Columbus, Ohio, the first nation-wide competition in 20 yr. With the USBM and the Joseph A. Holmes Safety Association sponsoring the contest and with the NCA Safety Division, the UMWA and various state mining associations cooperating, 70 skilled teams from 10 states vied for honors.

The NCA Safety Division again honored foremen with no-accident records, giving certificates to over 1,500 supervisors with clear records for 1 yr or more and inviting 168 with clean records for 4 yr or more to visit Washington for two days. About 70

# What the Record Shows

1951\* 1950 1940

FATALITIES

Bituminous: Total killed....690 545 1,204 Per million tons. 1.29 1.08 2.61

Anthracite:

Total killed ... 100 92 184 Per million tons 2.41 2.07 3.57

MAJOR DISASTERS

Numberofdisasters 5 0 6 Men killed . . . . . 157 0 276 Source: U.S. Bureau of Mines. \* Estimated.

of the top group accepted the invi-

The USBM, besides continuing its safety training courses in individual mines, established a new laboratory at Denver, Colo., to test mine air and organized two new safety sections one for haulage and the other for education.

Meanwhile, individual companies sped action along tested lines and found new ways to promote and reward safety. The following companies, to mention only a few, honored safety accomplishments in various ways:

Consolidation Coal Co. (Ky.)-Award of turkeys and hams.

Red Jacket Coal Co.—Banquet for 116 safe foremen.

Eastern Gas & Fuel Associates— Free trip to meeting of Mine Inspectors Institute, Lexington, Ky.

Amherst Coal Co. and Logan County Coal Corp.—Banquet for safety leaders.

Individual mines marked up enviable safety records. For instance, in February, Reliance, No. 7 mine, Union Pacific Coal Co., reported 3 yr without an accident. In November, Island Creek Coal Co. announced that 10 of its mines had produced 10,000,000 tons without a fatality and that one mine had produced 5,724,000 tons without a fatality since June, 1946.

The UMWA also was active, assisting at safety meets, propagandizing safety, pushing for laws that would give USBM inspectors the right to close mines and, in District 1, polling miners for their ideas on safety.

In spite of increasing vigilance, however, fatalities through the first 10 mo of 1951 ran slightly ahead of those in 1950. There were five major disasters—three explosions in West Virginia that killed a total of 33 men, one in Illinois that killed 119, and one in

Pennsylvania anthracite that killed five. The explosion on Jan. 18 was the first major disaster in bituminous since Nov. 4, 1948. The disaster-free record in anthracite stretched out a little longer-from Dec. 11, 1947, to March 29, 1951. These and other accidents underlined again the doctrine that everlasting, all-inclusive vigilance is the price of safety.

# **Speeding Coal Research**

RESEARCH IN MINING AND USING COAL made good headway in 1951. And if needs made known at BCR's annual meeting last February are filled, research will gain speed in 1952 and the years ahead.

The USBM and Alabama Power

Co. in February posted results of their second trial of underground gasification. They reported that coal, burned under deep cover, can produce a satisfactory boiler gas and that acceptable heating and synthesis gas eventually may be produced. Elsewhere, the Bureau joined with the Anthracite Institute and Wellman Engineering Co. to study ways of gasifying anthracite bone. At Morgantown, W. Va., the Bureau built two new pilot plants to make synthesis gas from coal.

Meanwhile, the USBM hydrogena-

# Coal Research-Progress and Needs



J. R. PURSGLOVE, JR., Vice President, Pittsburgh Consolidation Coal Co.

It is ominously clear to me that the coal industry is taking much for granted currently in view of the estimated large future demand for coal over the next 20 or 30 vr.

It is necessary to bestir ourselves now, to replace our old apathy by preparedness, and re-

mind ourselves that we can fill these future needs and meet the promised opportunities only if coal will undertake some long-range planning during the year 1952. It is either that, or witness a continuing decline in demand for coal during the same 20 or 30 yr. Prepare or despair.

The kind of planning that I have in mind is this:

1. Let sales and production policies be adopted which

will provide the necessary elbow room (monetarily speaking) for carrying out many essential, long-range projects as well as providing for efficient productive capacity when and where needed.

2. Make a New Year's resolution to take full advantage of what we already know by setting up nation-wide facilities at once for retaining present markets by making available to coal's customers our existing store of knowledge on how they can use coal more conveniently and efficiently.

3. I would most urgently suggest that a greatly expanded program of research and development be set into fast motion to bring forth new know-how so our industry can better serve the present-day needs of our country.

With broad vision harnessed to advancing coal technology, we can provide the country's continuously multiplying energy requirements.

It remains only for us to accept our challenge now, and act.

# Anthracite Research Looks Ahead in 1952



EVAN EVANS, President, Lehigh Navigation Coal Co.

Development and additional research on the mining, preparation and utilization of anthracite is expected to move ahead actively in 1952. A number of projects are being carried on cooperatively by many of the producing companies, the Anthracite Institute, the anthracite research laboratory of the U. S.

research laboratory of the U. S. Bureau of Mines, college research centers and industrial concerns.

Projects underway at the start of the year included:

1. Field testing of mining equipment and mining methods.

Field survey of fine-coal plants as part of the study of factors in design and operation of launder screens.

 Economic and technical aspects in the conversion of bone coal to produce gas and underfiring colliery boilers.

Operating and design information in anthracite producer data for the Class 3 and Class 4 stokers.

All anthracite agencies are pooling their efforts in the selection and prosecution of additional projects for 1952. Continued progress in the development of anthraciteburning equipment and greater efficiency in new boilerburner units may be expected.

Sales of automatic anthracite-burning equipment were estimated 13% greater in 1951 over 1950. This trend should continue.

tion plant at Louisiana, Mo., showed that coal can be turned into oil with little loss—3.7 bbl of oil per ton of coal on a moisture-free basis. Accordingly, Interior Secretary Chapman asked private industry to carry on from there. His request, plus the Bureau's cost estimates on hydrogenation, provoked a debate with the National Petroleum Council on the economics of making oil from coal. Toward the end of the year, the Bureau submitted its cost data to a private engineering firm for review.

Even so, Interior Department officials reported that a group of financial interests had made a tentative proposal for a hydrogenation plant, mostly with an eye to chemicals output. Another firm, Union Carbide & Carbon Co., built an \$11,000,000 plant in West Virginia to make chemicals from coal. And Pittsburgh Consolidation Coal Co. announced agreement with the Bureau for a joint project that will turn company-developed coal-tar liquids into chemicals and, eventually, into synthetic liquid fuels.

Long-term research by the Bureau along another line bore fruit when the Aluminum Co. of America announced that it would build in Texas a new aluminum plant powered by electricity made from lignite. The lignite—7,000 tpd—will be treated in drying chambers developed from the Bureau's pilot models in the Rocky Mountain region.

Lignite also figured in dedication of the Bureau's new laboratory at Grand Forks, N. D. Earlier, in February, the Bureau started work on a \$180,000 addition to the Schuylkill Haven anthracite laboratory.

Another Bureau project-pipeline movement of coal-reached the point of dollars-and-cents discussion. Along this line, Hanna Coal Div. built a test pipeline on its Georgetown properties in Ohio and obtained publicutility status for a future line that would pump a coal-and-water mixture to market.

Industry-wide research meanwhile made steady headway, BCR, with a general program supported by 174 coal companies and operators' associations, 10 railroads and 3 equipment companies, sped its search for new and better ways to use coal. Jointly, the agency worked with Battelle Memorial Institute and other organizations on smoke and flyash control, railroad electrification, block heating,

electric steel furnaces, "package" boilers and gasification, the last involving tests on the new Kaiser gasifier.

Special BCR projects on mining machinery, supported by 55 coal and coal-land companies and 4 railroads, resulted in trial runs for the new BCR continuous miner and in purchase by Joy Mfg. Co. of rights to certain features of the BCR stainless-steel belt conveyor. To test this and other equipment, the Joy organization opened an experimental mine of its own.

The Locomotive Development Committee, supported by five coal companies and nine railroads, moved to Dunkirk, N. Y., for final tests on coal-handling and flyash-removal devices for the gas-turbine locomotive.

Though research advanced in 1951, feeling ran strong in some quarters that the payoff was slowed by lack of dollars. With that in mind, BCR set up a 39-man committee to evaluate laboratory research and integrate engineering, engineering service, technical information and sales promotion in the BCR program. The committee's report, expected at the annual meeting in 1952, will ask for wider and more generous support for research.

# Winning Friends and Training Men

GOOD PUBLIC RELATIONS means putting your house in order and then telling people about it.

Coal's house is in good order. With that structure to build on, the industry told the public the facts about coal and its men.

NCA's Bituminous Coal Institute broadened its advertising and helped prepare articles for general and special-interest magazines. The agency also brought out the 1951 Bituminous Coal Annual, updating tables from past years, rewriting the text and adding new material.

Besides distributing older films— "The Magic of Coal" and "Underground Adventure"—to clubs, schools and TV stations, BCI joined March of Time in filming a \$100,000 color movie, "Powering America's Progress," on coal mining and coal uses. The new film soon will be released.

BCI looked to schools as a fertile field for public relations. The educational division staged exhibits at teachers' conventions, published a new coal map and fed a stream of teaching aids to teachers and students. In the first 6 wk of the current school year, BCI received 10,831 requests for booklets and leaflets and mailed out 100,000 items.

BCI's Speakers' Bureau carried on wherever civic, church and women's groups met. Speechmakers told about coal, its share in industrial progress, its problems and its future.

Individual companies did their share at the grassroots level. In Alabama, Tennessee Coal, Iron & R. R. Co. gave the 350-bed Lloyd Noland Hospital, plus \$750,000 for an outpatient clinic, to a foundation serving the people of Jefferson County. In Ohio, Hanna Coal Div. added civil defense to its first-aid training for miners and opened the courses to townspeople and school children as well. At Wheelwright, Ky., Inland Steel Co. brought the World Series via TV into the community recreation hall and later arranged for townspeople to tap programs off the company's coaxial cable.

The Big Sandy-Elkhorn Coal Operators' Association staged its annual high-school Seniors' Day with a visit to mines of Consolidation Coal Co. (Ky.). Likewise, anthracite collieries were hosts to high-school and college groups. Picnics, family days and open houses marked other local campaigns to acquaint families with the industry's progress and its contributions to good living.

More need for skilled men spurred coal's training program in colleges and high schools.

On the college level, NCA's Vocational Training and Education Committee met at the Missouri School of Mines, the University of Illinois and the Colorado School of Mines. The committee talked with faculty and students, surveyed courses and sought ways to draw more men to mining engineering. The committee steered young men to summer jobs, found permanent jobs for graduates and provided data about coal for students' essays and theses.

The year saw a substantial increase in coal scholarships. Enos Coal Co., for example, announced two new scholarships; Philadelphia & Reading Coal & Iron Co., one; Virginia Coal Operators' Association, one; and Princess Elkhorn Coal Co., five, bringing to 14 the total number of students now enrolled on that company's scholarships.

In high schools, the work was aimed at interesting youngsters in mining as a vocation. In Ohio, West Virginia, Kentucky and Western Pennsylvania, coal men backed high-school classes in mining with literature, suggestions and personal interest. Eastern Gas & Fuel Associates, for instance, provided leaflets, booklets and other information for schools in the company's mining communities. For the not-distant future, regional technical institutes for training mineworkers and others looked like a real possibility following a proposal by interested operators in the spring. Though interest centered in Western Pennsylvania at the start, it soon spread to other areas.

# 1952—Better Than 1951

THE YEAR AHEAD LOOKS GOOD. Weigh the prospects, and you'll add them up something like this:

- Industrial activity will move on up. That's because the defense program is moving from plant building into goods production.
- Population will grow by 1,500,-000 to 2,000,000.
- National income will boom as more people go to work. They'll have money to spend for goods, services and comfort.
- Electric utilities and steel will bring in new plants and more capacity. Both depend on coal.
  - 5. Export markets will stay strong

until Western Europe's coal crisis ends. That isn't likely to happen in 1952-or the next year either.

6. A drawn-out stoppage in the mines is unlikely.

But there are some obstacles that may slow you down:

- You may have a harder time getting supplies and equipment. Steel, copper, aluminum, tools and spare parts will be scarce.
- You may run short of men, especially skilled men. The drain will be most severe on young men of draft age.
- It won't be any easier to get railroad cars. Car makers are far behind their goals.

4. You'll have the old familiar problem of beating your rising costs and the vexing problem of staying ahead of the tax collector. It's a vicious circle. The more taxes you pay, the smaller your net is and the harder it is to buy new equipment to keep your costs down so you can make a profit to pay taxes with.

But, on balance, the good in 1952 may outweigh the bad. Whether it works out that way depends upon the enterprise with which coal men grasp opportunities and the ingenuity and doggedness with which they attack problems.

If performance in past years is an index of success to come, coal men will make 1952 better than 1951.

# How Appalachian Coals, Inc., Sees 1952



JULIAN E. TOBEY, President, Appalachian Coals, Inc.

The demand for bituminous coal in 1952 should continue to increase, in keeping with the upward annual trend since 1949. The factors which are expected to result in a greater coal production in 1952, compared to 1951, may be briefly stated as follows.

1. Definitely scheduled production of defense material and equipment will be at a much higher level during 1952.

Civilian buying is expected to resume at a higher level, reflecting the working-off of consumer inventories and higher incomes.

 The production of consumer durables, despite cutbacks in material allocations, will be historically at a high level. For instance, some 4,000,000 passenger automobiles will be produced in 1952.

 It now seems assured that overseas exports of bituminous coal will exceed 1951 volume by upwards of 10,000,000 tons,

The practically certain increase in coal requirements by the electric utilities and the steel and byproduct industry will account for many millions of tons of additional production.

6. Material scarcities have slowed up pipeline expansion.

The result should be a demand for bituminous coal in

1952 somewhat as follows, and should result in an equivalent production depending, of course, upon whether stockpiles are reduced or added to.

# 1952 Bituminous Coal Demand

Industry or Use	Net Tons
Electric Utilities	111,800,000
Byproduct coke	109,600,000
Beehive coke	11,350,000
Steel and rolling mills	8,650,000
Cement mills	9,050,000
Railroads	51,350,000
Other industries	100,650,000
Total industrial	402,450,000
Retailer deliveries	80,650,000
Unknown use	6,000,000
Bunker fuel	1,080,000
Total U. S. use	490,180,000
Canada	24,200,000
Overseas	46,500,000
Total export	70,700,000
Total 1952 bituminous demand	560,880,000
Increase over 1951, 5.4%	

Bituminous coal, in making its indispensable contribution to the re-arming of the Western world, is also preparing for the return of normal competitive marketing. The industry is looking forward to the future and expects to answer its competition and satisfy its customers always with "more of a better product" designed to meet the most exacting needs for heat and power.

# Loader and Cleaner Sales

Coal mechanically loaded and cleaned continued to gain, percentagewise, in 1951-Export market for American units increases—Capacity of new cleaning equipment sold in 1951 up 14% over sales in 1950

By W. H. YOUNG, Chief, Bituminous Coal Section, and R. L. ANDERSON, Engineer-Economist, U. S. Bureau of Mines, Washington, D. C.

# Table I—United States Bituminous Coal and Lignite Production by Methods of Mining and Mechanical Cleaning

	1949		195	0	1951*	
	Thousands of Net Tons	Percent of Total	Thousands of Net Tons	Percent of Total	Thousands of Net Tons	Percent of Total
Surface stripping. Hand-loaded underground Mechanically loaded	106,045 109,447	24.2 25.0	123,467 120,119	23.9 23.3	118,000 121,000	22.1 22.6
underground	222,376	50.8	272,725	52.8	296,000	66.3
Total production  Mechanically cleaned	437,868 153,652	100.0 35.1	516,311 198,699	100.0 38.5	536,000 225,000	100.0

# Table II—Underground Bituminous and Lignite Production, by Methods of Loading

	1949		195		1951*	
	Thousands of Net Tons	Percent of Total	Thousands of Net Tons	Percent of Total	Thousands of Net Tons	Percent of Total
Loaded by machine†		57.7 9.3	237,279 35,446	60.4 9.0		:::
Total mechanically loaded	222,376 109,447	67.0 33.0	272,725 120,119	69.4 30.6	296,000 121,000	71.0 29.0
Total underground production	331 ,823	100.0	392,844	100.0	417,000	100.0

† Includes mobile loaders, continuous miners, scrapers and conveyors equipped with duckbills or other self-loading heads.

Included under "Total mechanically loaded."
 Includes hand-loaded conveyors and pit-car loaders.

# Table III-Mechanical-Loading and Conveyor Units Sold for Underground Use in Coal Mines, as Reported by Manufacturers

	1946	1947	1948	1949	1950	1951	change, 1951 from 1950
Mobile lowlers!	495	486	726	286	289	287	- 0.7
Scrapers <sup>2</sup>	35	35	49	18	9	12	+33.3
Shuttle cars	8			543	465	524	+12.7
"Mother"	187	204	235	116	133	114	-14.3
Room or transfer	1,157	987	1,200	541	373	331	-11.3
Facel.	209	226	374	165	116	119	+ 2.6
Number of manufacturers reporting	24	23	22	22	20	21	

1 Includes continuous miners, beginning in 1948.

Reported as scrapers or scraper haulers and hoists.

Not available. Total number of shuttle cars sold 1946-48, inclusive, was 2,849.

Conveyors are classified as to the length the power unit has capacity to take: "Mother," capacity over 500 ft.; room or transfer, capacity 100 ft. to 500 ft.; face, capacity under 100 ft. "Includes" bridge" conveyors, beginning in 1950.

SHIPMENTS of mechanical-loading equipment for underground use in coal mines in the United States, in terms of capacity, were approximately the same in 1951 as in 1950. The capacity of mechanical - cleaning equipment sold for use at bituminouscoal mines was 14% greater in 1951 than in 1950. Shipments of shuttle cars and face conveyors for use in coal mines in the United States in-creased 13% and 3%, respectively, in 1951 over 1950, while "mother" conveyor shipments decreased 14% during the same period.

This survey was made possible by the courteous cooperation of all known manufacturers of mechanicalcleaning equipment for bituminous coal mines and manufacturers of mechanical-loading and supplementary haulage equipment for use in all coal mines in the United States. Data from various trade journals also were utilized.

Mechanical-loading-unit and supplementary-haulage-equipment "Sales in 1951" represent shipments made during 1951. However, only 25% of the total capacity of mechanical-loading equipment sold in 1951 was placed in operation during that year. The remainder will be installed later.

# **Mechanical Loading**

Bituminous coal and lignite mechanically loaded in underground mines increased from 222,375,882 tons in 1949 to 272,724,612 tons in 1950, or 23%. Mechanical loading in Pennsylvania anthracite mines increased from 11,858,088 tons in 1949 to 12,335,650 in 1950, or 4%.

Table I shows data on bituminous coal and lignite production by methods of mining and mechanical cleaning for 1949-51, inclusive. The percentage of this total output mechanically loaded and mechanically cleaned continues to increase. During 1951, approximately 77% of the total out-

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# Table IV—Sales of Mechanical-Loading Equipment in 1951 Compared With Machines In Active Use in Preceding Years

		Number of	Machines in	Active Une,	as Reported b	y Mine Oper	rators	as Reported by Manufacturers in 1951
	1944	1945	1946	1947	1948	1949	1950	
Rituminous-coal and lignite mines:								
Mobile leading machines	2,737	2.960	3,200	3.569	3.980*	4.205*	4.318*	287*
Scrapers	87	87	75	67	56	46	39	4
Pit-car loaders	241	142	93	71	37	17	12	
Conveyors equipped with duckbills or other self-loading								
heads	1,331	1,383	1.521	1,531	1,632	1,483	1,329	
Hand-loaded room conveyors, number of units	3,236	3,385	3,470	3,979	4,126	4,312	4,434	297
Anthracite mines (Pennsylvania):								
Mobile loading machines	12	20	27	25	19	27	30	
Scrapera	491	548	564	594	643	589	556	
Hand-loaded room conveyors, number of units;	2,807	3,006	3,233	3.457	3,562	3,618	3.460	34

<sup>\*</sup> Includes continuous miners

# Table V—Mechanical-Loading Equipment in Actual Use in 1950, by States, Compared With Sales Reports in 1951

	-Mobile I	Londers*	Sera	pers	Room Conveyors		
	In use in	Sales in	In use in	Sales in	In use in	Salen	
	1950	1951	1960	1951	19601	1961	
Bituminous and lignite mines	E.						
Alabama	136	5	7		359	1	
Alaska					1		
Arkansas					74		
Colorado		* 7	1	2	298	17	
Illinois		27			16	3	
Indiana		1			4		
Iowa					5		
Kentucky	508	38			669	47	
Maryland					34		
Montana					14		
New Mexico	17	1			2		
North Dakota	4				100		
Ohio		13			114		
Oklahoma	6	1			148	2	
Pennsylvania		58	10		930	73	
Tennessee	28	3			145	3	
Utah	123	6	1		94	2	
Virginia		5		1	188	3	
Washington		2			90		
West Virginia		119		1	2.321	146	
Wyoming		1	12		258		
Total	4.318	287	39	4	5.763	297	
Pennsylvania anthracite	30	201	566	ě	3,460;	34	
Grand total	4,348	287	595	12	9,223	331	

<sup>\*</sup> Includes continuous miners

put was either mechanically loaded at underground mines or loaded by power shovels at strip mines records show.

Underground production of bitumi-

nous and lignite, by methods of loading, is shown in Table II. The preliminary figures for 1951 show that 71% of the underground output was loaded mechanically and the re-

mainder, or 29%, was hand-loaded into mine cars.

Number of

Types of Units Sold—Table III lists the number of mechanical-loading and conveyor units shipped for underground use at all coal mines in the United States, 1946-51, inclusive. Shipments of mobile loaders, which include continuous miners, decreased from 289 in 1950 to 287 in 1951. Shipments of scrapers increased 33% and shipments of shuttle cars increased 13%, in 1951 over 1950. "Mother" and room or transfer conveyors both decreased in 1951 from 1950, while face conveyors showed a slight increase during the same period.

Exports of underground mechanical-loading equipment in 1951, in terms of capacity, amounted to 23% of the shipments to mines in the United States, compared with 14% in 1950.

Types of Mechanical - Loading Equipment Sold Compared With Units in Use—Table IV shows the trends in demand for various types of mechanical-loading equipment. There has been a substantial increase in the use of all types of mechanical-loading equipment except scrapers and pit-car loaders.

Table V shows the number of mechanical-loading units shipped to various states in 1951 compared with the number in use in 1950, as reported by mine operators. "Room conveyors" in Tables IV and V were listed as "conveyors" in previous

Canvass of sales of pit-car loaders discontinued in 1945.

Sales of conveyors equipped with duckbills or other self-loading heads are included with hand-loaded conveyors.

Includes pit-car loaders and conveyors equipped with duckbills or other self-loading heads.

<sup>†</sup> Includes hand-loaded conveyors and conveyors equipped with duckbills or other self-loading heads.

I Includes pit-car loaders.

annual reports on sales of mechanicalloading equipment. The sales of room conveyors are not comparable with room conveyors in use. To avoid duplication in tonnage mechanically loaded, the mine operator was instructed to report only "hand-loaded" and "self-loading" conveyors. Therefore, room conveyors loaded by mobile loaders are not included with "Room conveyors in use in 1950."

# **Haulage Equipment**

Face Conveyors—A face conveyor is from 10 to 100 ft in length and is used parallel to the face of the room to move material along the face to the room conveyor. Sales are shown in this report for the first time. Table III lists total sales, 1946-51, inclusive, and Table VI lists sales, by states, for 1950 and 1951. Data on number in use are not available.

Shuttle Cars—Sales of shuttle cars increased from 465 in 1950 to 524 in 1951. Details of shipments to various states in 1950 and 1951 are given in Table, VI. There were 3,294 shuttle cars in use in bituminous and lignite mines in 1950. Details of the number of cable-reel and battery-type shuttle cars in use, by states, in 1949 and 1950 are given on p 26, Bureau of Mines Mineral Market Report, No. 2032. Export of shuttle cars increased 4% in 1951 over 1950.

"Mother" Conveyors-For the purpose of this study, a "mother" conveyor is defined as a sectional, extensible, power-driven conveying unit that can handle over 500 feet of conveyor. Main slope conveyors are excluded. Table III lists sales, 1946-51, inclusive, and Table VI shows shipments, by states, in 1950 and 1951. In 1950, 374 bituminous-coal mines used 295 miles of "mother" conveyors. Detailed data by states on "mother" conveyors in use, 1945-50, inclusive, are given on pp 27 and 28 of Bureau of Mines Mineral Market Report 2032. Exports of "mother" conveyors were 21% less in 1951 than in 1950.

# **Mechanical Cleaning**

Reports from 19 manufacturers of bituminous-coal cleaning equipment show that the total capacity of 1951 sales was 13,900 net tons of clean coal per hour, compared with 12,200-ton capacity sold in 1950, an increase of 14%. Sales in 1951, by type of equipment, in terms of capacity, show that jigs were first with dense medium and wet tables following. Approximately 60% of the total capacity of

Table VI—Sales of Face Conveyors, Shuttle Cars, and "Mother" Conveyors, 1950-51, by States

	Face Conveyors*		Shu	ittle	"Mother"		
			C	ars	Conveyors		
	1950	1961	1960	1961	1950	1951	
Bituminous and lignite mines:							
Alabama			7	26		140	
Arkansas					1	111	
Colorado	644	2	6	6	***	6	
Illinois			75	70	16	19	
Indiana			16	4	+51		
Kentucky	20	24	94	46	24	18	
Ohio			24	20		2	
Oklahoma			7		4	3	
Pennsylvania	18	19	111	131	29	24	
Tennessee	2			6		1	
Utah			20	8	2	2	
Virginia	2	6	2		4	3	
West Virginia	64	60	99	197	41	36	
Wyoming			6	2	3		
Total	116	111	466	524	132	114	
Pennsylvania Anthracite					1		
Grand Total	116	119	465	624	133	114	

<sup>\*</sup> Includes "bridge" conveyors

# Table VII—Bituminous Coal Mechanically Cleaned in 1950 Compared With Sales of Mechanical-Cleaning Equipment

in 1951, by States

		Annual		
		1950		Capacity
	Number of	Net Tons	Percent Output	of Equipment
	Plants in	of Cleaned	Mechanically	Sold in 1951,
	Operation	Coal	Cleaned	Net Tons*
Alabama	. 62	11,548,036	80,1	1,503,000
Alaska	. 5	175,783	42.6	4911
Arkansas		27,600	2.4	****
Colorado	6	1,277,747	30.0	
Illinois		35,695,520	63.4	2,385,000
Indiana		14,101,094	70.7	
Kansan,		1,303,614	61.3	
Kentucky	. 68	21,198,829	27.0	1,559,000
Maryland	. 2	30,343	4.7	
Missouri		2,397,442	80.9	2224
Montana		160,550	6.4	
New Mexico		74,290	10.2	
Ohio		10,708,879	28.4	
Oklahoma	. 6	896,344	33.5	
Pennsylvania:		38,547,253	38.4	3,918,000
Tennemee		353,514	7.0	*
Utah	. 6	2,312,384	34.7	
Virginia		4,796,515	27.2	
Washington		781,346	89.4	
West Virginia		52.311,435	36.3	6.839,000
Undistributed		*******		1,786,000
Total	612	198,098,518	38.5	17,980,000

<sup>\*</sup> Based on average days mines were active in 1950 and 7.0 hr. per day.

cleaning equipment sold in 1951 was for additions to present installations, and the remainder comprised new plants. Table VII gives data on bituminous coal cleaned in 1950, by states, and the annual capacity of equipment sold in 1951.

<sup>†</sup> Included in "Undistributed."

<sup>‡</sup> Includes some coal mined in Pennsylvania and cleaned in Ohio, and a small tonnage mined in other states and cleaned at a consumer-operated plant in Pennsylvania.

tates and cleaned at a consumer-operated plant in Pennsylvania.

§ Includes some coal mined in West Virginia and cleaned in Ohio and Pennsylvania.

AUGERING approaches automatic mining underground



MORE POWER extends stripping-equipment range



FINE-COAL CLEANING highlights preparation

# Mining Progress in 1951

Deep Mining • Preparation • Stripping

# **Deep Mining**

Closer approach to automatic production achieved by new face units and auxiliaries.

THE CONTINUOUS MINER occupied the center of the stage in deep-mining developments in 1951. The number in service increased substantially. More important, operators and builders gained much experience in how to design and use them for maximum results. Year-end reports indicated that 160 to 170 continuous miners were on the job, with about 50 in regular production, but less than five mines getting all their output from continuous units.

Since the cutting, or mining head is the critical factor in continuous-miner operation, the design of this member received the lion's share of the attention, with the result that the field was more definitely narrowed to the "milling" or "drum" type on the one hand and the boring type on the other. New lows in height also were achieved, making possible conventional-type miners in coal as low as 30 in. Miner application also was successfully extended to coal pitching as much as 9 deg in the United States.

#### LONGWALLING

With tests under way or scheduled for three overseas machines and one developed in Canada, prospects were that longwalling would receive new impetus. The overseas units include a planer, a cutter-loader and a stripper, while the Canadian unit is a crawler machine modified from a standard continuous miner. All the machines are designed for walls up to 500 ft or more in length, with 300 ft as perhaps the usual minimum. And part of the machines are specifically designed for the thinner seams.

A major factor in extensive use of longwall is roof support and control. A by-product of the tests with these machines therefore can be expected to be an increase in knowledge in the field of roof support and control.

"Continuous-face" mining, where rooms are extended to 2,000 ft or more proved highly successful in at least one additional operation in 1951. A major advantage is a sharp reduction in moving of the regular room conveyors, which feed onto cross belts advanced at 300-ft or other intervals.

# AUGER MINING

The year 1951 was marked by the first full-scale test of auger mining underground. In 32-in coal, these tests indicated that over 30 tons per crewman could be expected, and that auger direction can be easily controlled. Recovery is of course lower than can be achieved with normal methods though the auger can be used where top and other conditions forbid regular production. Indications at the year end were that several new mines would rely on augering, and that it would be added at a number of existing mines. A feature of the auger is production without men going back to the face. Thus, it represents a closer approach to remote or automatic mining.

#### PITCH MINING

Although mechanization of the more steeply pitching veins still presents major problems, some progress was made in 1951, and considerable was achieved where the pitches are lighter. For example, as previously noted, a standard-type continuous miner was successfully applied to coal pitching 9 deg, both in development and in room work straight up the pitch.

For the steeper pitches, attention was concentrated on longhole drilling and augering. Normally, mining plans involving longholing were built around development of chambers by conventional methods and then shooting out the pillars individually by drilling them, or by using longer holes through a series of pillars and then shooting them one by one or as a group. A modification was practically complete production by drilling and shooting from rock openings beneath the seam.

A combination of big and small drills also was still under active consideration for steep pitches. Large holes would be drilled at intervals of, say, 10 ft, with small holes between, after which the intervening pillars would be shot in lifts starting at the

Conveyors, however, remained the principal mechanization units in pitching operations, and developments included wider use of a small, light self-loading head for crosscutting and other special jobs.

# FACE PREPARATION

Installation of higher-capacity cutters, increased use of special bits, and growing employment of hydraulic drills again featured face preparation in 1951, with increased emphasis on allaying and collecting dust with water and water-chemical compounds. And with the increase in trackless installations, there was a major increase in conversions of cutters and loaders to rubber, with in many instances, a major increase in tonnage handled.

Coal breaking was featured by further emphasis on air, and a new chemical coal breaker underwent initial field tests, with excellent results reported.

#### **ROOF SUPPORT**

Bolting continued to make rapid gains in roof support at both the working face and elsewhere. In fact, the gains were limited in many areas only by ability to acquire drilling and bolting equipment and materials. Increased attention was devoted to eliminating dust by collectors and wet drilling.

Coating of roof and ribs with vinyl plastic or asphalt-base compounds to prevent disintegration from air slacking received increased attention in 1951, with good results reported from a number of applications.

#### FACE TRANSPORTATION

Getting the coal away from the loading machine or continuous miner was the subject of even more intense effort in 1951. And while the situation still could be described as in a state of flux at the end of the year, some possible trends began to show up. Perhaps the major one was renewed interests in conveyors for room work as a result of further development and installation of bridge-type units, cascade systems using a series of individually powered portable units, and articulated conveyor systems employing a series of units coupled together. An added starter was the stainless-steelbelt extensible shaking conveyor.

The standard shuttle car continued as a major means of getting coal away from loaders and continuous miners. With miners, experience at several operations was leading to the conclusion that dumping the coal on the floor and using an auxiliary loader would improve productivity. In one instance, it was reported that changing from the surge car to this system increased production 30%. In another, averages of 440 tons per machine-shift, with peaks of over 700 tons, were reported.

The track-mounted shuttle car entered the lists in 1951. The unit is generally similar to the regular shuttle car except that it is designed to run on track with a locomotive for traction and a cable from the locomotive for powering the shuttle-car equipment. The cars dump into track hoppers for transferring the coal to the regular mine cars. One or two cars are used per loader, depending upon distance.

The tracklaying, or crawler-mounted shuttle car, also was undergoing field trials in 1951. Features include low ground pressure, greater maneuverability and higher capacity.

# MAIN HAULAGE

The advent of the first American diesel locomotive, though it was immediately attacked by the union and certain other interests, was a high spot in main-haulage developments in 1951. The belt retained its lead as a hoisting medium, and marked up new gains in panel transportation while continuing to give the mine car competition in mainline haulage, though big, modern cars and locomotives remained hard to beat. In fact, new all-belt operations in 1951 were at least partly matched by changes back to mine cars at other operations, with the dropbottom type retaining its

The problems of speeding up car and trip movement and preventing loss of time for face units were tackled from all the original angles and, in addition, there was considerable expansion in special barney-type trip handlers at conveyor and other transfer points for positive control of trip movement without stopping coal flow.

#### HYDRAULIC HOISTING

The possibility of other types of coal movement, particularly in hoisting, was increased in 1951 as a result of 1951 development in both coal and metal. One coal company, for example, completed an experimental installation for pumping coal, while a metal producer installed a hydraulic lift for bringing ore to the surface. With a 365-ft lift, capacity with 2,000 gpm is given as 120 tph; with 2,500 gpm, 240 tph. Top size of the material is 8 to 9 in.

# POWER AND ELECTRIFICATION

New installations of selenium rectifiers, including units up to 300 kw, definitely brought this conversion unit farther into the coal picture in 1951. At the same time, AC for underground service made additional gains, with emphasis on modern portable power centers built around dry-type or sealed gas-filled transformers. There was a wide increase in the use of modern junction- and distribution-box equipment, safety connectors for cables, and automatic protection for both men and machines against shorts. The inverted trolley found new recruits, and new line materials included insulated Jhooks for hanging cables, pipes and the like.

#### SAFETY

Roof-bolting continued to reduce injuries and fatalities, and the spread of training in accident-prevention was proving increasingly valuable in making other safety measures more effective. An outstanding development in decreasing dust at the face was the successful adoption of water infusion, or pillar-soaking, at a number of western mines. Steam infusion, as practiced at some British operations, also was under consideration. Others found fog guns and millisecond-delay detonators quite effective. The use of core-drilled holes for clean, fresh water for use on miners and in other ways at the face increased.

And with progress being made in reducing roof-fall accidents, increasing emphasis was being laid in 1951 on reducing transportation accidents—the second largest source of injuries and fatalities in underground mining.

Coating of stoppings with vinyl plastic to increase air delivery to the working sections registered a major increase, and the inflatable brattice was undergoing field trials with indications that it would offer substantial advantages in fast-moving panel mining. The number of auxiliary air and escape shafts increased substantially, with greater attention given to drilling such openings.

# OTHER SERVICES

Lightweight plastic and aluminum pipe marked up still further gains, along with quick couplings for steel pipe, in underground water handling in 1951. One anthracite company successfully applied plastic pipe to lining vertical boreholes. Installation of deepwell turbine pumps increased to save both pumping labor and the firebossing that would be necessary with pumps and pumpers underground.

Prefabricated steel buildings for

Prefabricated steel buildings for various types of surface uses found increasing application in 1951, which also was marked by a substantial increase in construction of new manand-materials portals, accompanied by wider installation of special cars and trucks for handling men, equipment and materials safely and efficiently.

In the field of maintenance, especially of the preventive type, centralized automatic lubrication was adopted by an increasing number of companies for preparation plants up to 1,500 tph, and for loading machines and other equipment underground. Water filling of tires proved successful in increasing life on underground equipment operating at less than 5 mph.

"Radio" for underground communication continued to expand in 1951. In addition, at least one mining company was preparing to install microwave radio to its deep mines.

# Stripping

Cost - cutting through more power and higher capacity feature development in 1951.

TO MEET the problems of moredifficult conditions, coal strippers and equipment builders concentrated on machines capable of handling deeper overburden at a faster rate. Operators continued to rely on standard types of machines, though interest in new types was reflected in construction of additional wheel-excavator equipment and further consideration of the possibilities of stackers and other types of spoil transporters, including trucks and special rock wagons.

# OVERBURDEN PREPARATION

Dry-type vertical drills gained substantially in 1951, though the conventional churn and horizontal equipment, with added power, remained the leading types. The year was fea-

# New Bituminous Preparation Facilities in 1951\*

Coal Company	Plant Location	Capacity, TPH	Preparation Equipment
Alabama By-Products Corp.	Berry Ate	50	Western Machinery
Alabama Power Co.	Gorgas Ala		McNally Pittsburg
	Ames, W. Va	50	Kanawha!
Atlantic Crushed Coke Co.	New Derry, Pa	10	Deister Machine
Bell & Zoller Coal & Mining Co	Indianates Otto: 144 (4)	22	McNally Pittshurg
	Elisworth, Pa.		Roberts & Schaefer
Bethlehem Mines Corp.	Barrackville, W. Va.		Roberts & Schaefer
			Jeffrey: Roterts & Schaefer
Bethlehem Steel Co.	Johnstown, Pa. (44)	660	Deister Concentrator
Bluestone Coal Co	Bluestone, W. Va.	100	Roberts & Schaefer
Boone County Coal Corp	Moncio, W. Va. (8)	500	McNally Pittsburg
Brushy 'ountain Coal Mines	Petros, Tenn	200	Hawarth
Buckeye Coal & Coke Co	Stephenson, W. Va.	100	Jeffrey 1
Central Ohio Coal Co	Unionville, Ohio	900	Roberts & Schaefer <sup>12</sup> Jeffrey <sup>13</sup>
Shelatanhar Carl Ca	Booth, W. Va	75	Fairment <sup>13</sup>
Christopher Coal Co	National, W. Va.	90	Fairmont's
Clinchfield Coal Corp.	Moss, Vo. (24)		Delater Concentrator
Colorado Fuel & Iron Corp.	Pueble, Cele. (2)	360	Roberts & Schaefer
constant rues or iron Corp.	Westen, Cole.		Jeffrey McNally Pittsburg
Consolidation Coal Co. (W. Va.)	Stringer, W. Va.	200	Link-Beit
Courtesy Coal Co	Manchester, Ky.		McNally Pittsburg
Deal Coal & Sand Co.	Ferrelisburg, W. Va.	15	Deister Concentrator
DeBardeloben Coal Corp.	Sipsey, Ala		Deister Concentrator
Delmont Fuel Co.	Greensturg, Pa.		Mchally Pittsturg
Deita Calleries Co			McKally Pittsburg"
Eastern Coal Corp.	1		McNally Pittsburg <sup>18</sup>  Kanawha <sup>18</sup>
Eastern Gas & Fuel Associates	Keystone, W. Va.		Jeffrey20
Imerald Coal & Cake Co.	Keystone, W. Va.	700	Roterts & Schaefer
Evan Jones Coal Co.	Ancherage, Alaska	3) 30	McNally Pittsburg
Freeman Coal Mining Co.	Freeburn, III		Roberts & Schaefer <sup>13</sup>
Gaston Coal Co.	Alpeca, W. Va.	45	Kanawhali
auf Smokeless Coal Co	Tams, W. Va.	120	Roberts & Schaefer
Suyan Eagle Coal Co.	Blair, W. Va.	500	McNally Pittsburg
	Stowe, W. Va	270	McNally Pittsburg
Suyan River Co			Deister Concentrator
			Fairment <sup>ii</sup>
nland Steel Co.			Link-Belt
amison Coal & Coke Co			Peterson <sup>11</sup>
one Star Coal Co	Brazil, Ind		McNaily Pittsburg*
Asumee Colleries Co.	Jasonville, Ind. (2)	90	Rebt. Helmes
Mid-Continent Coal Corp		450	McNally Pittsburg
Ainers Coal Co	Fies, Ky. (8)	100	McNally Pittsburg** Deister Machine
t. O. Murphy Co.	Pittsburgh, Pa	60	Jeffrey!
lational Mines Corp.	Morgantown, W. Va.	50	Link-Belt
lew River Co	Carlisle, W. Va. Cranberry, W. Va.		Kanawha <sup>10</sup> Kanawha <sup>10</sup>
	Garden Greund, W. V.	a	Kanawhali
lew Shawmut Mining Co	Tyler, Pa	70	Kanawha <sup>2</sup>
lerth-East Coal Co.	Wurtland, Ky	300	McNally Pittsburg
liga Coal Co	Coalwood, W. Va Cokeburg, Pa.	1,250	Nelson L. Davis <sup>11</sup> Prina <sup>12</sup>
eabody Coal Co.	Pawnee, III		Roberts & Schaefer
	Vivian, W. Va.	100	Jeffrey <sup>11</sup> Roberts & Schaefer <sup>14</sup>
eerless Coal Co. eters Creek Coal Co.	Summersville, W. Va.	50	Roberts & Schaefer <sup>3</sup>
ittsburgh Coal Co	Renton, Pa	30	Fairment
onfeigh Smokeless Coal Co	Garrett, Pa	60	Joffrey <sup>33</sup>
owhatan Mining Co	Aults, Onlo		Kanawha
remier Pocahontas Coal Co	Herndon, W. Va	150	Western Machinery <sup>55</sup>  Kanawha <sup>11</sup>
	were an arrangement of the same and	200	
vincess Derethy Coal Co.	Robin Hood, W. Va		Jeffrey!
vincess Derethy Coal Co	Robin Hoed, W. Va Dela, W. Va		Jeffrey!! Kanawha!

tured by wider use of detonating fuse and the introduction of the MS connector. Installed in detonating-fuse trains, the connectors not only proved highly efficient in setting off charges but in reducing vibration, with consequent reduction in complaints.

# STRIPPING

Though the shovel continued to hold its commanding position, the walking dragline registered new gains as a spoil-handling medium. Considerable effort was devoted to increasing the power and capacity of smaller shovels without increasing size and weight. As a result, equipment representing a new high in capacity on single crawlers went into successful operation during the year.

Tandem operations showed another increase in 1951, with greater attention devoted to other means of assisting the conventional stripping unit in

# New Bituminous Preparation Facilities in 1951\*

Coal Company	Plant Location	TPH	Equipment
Red Parret Coal Co	Prenter, W. Va	135	Kanawha*   Link-Bels*
Republic Steel Corp	Sayre, Als. (19)	425	McNally Pittsburg
Ridgeview Coal Co Rochester & Pittsburgh Coal Co	Ridgeview, W. Va Ernest, Pa		Kanawha <sup>26</sup> McNaily Pittsburg <sup>26</sup> McNaily Pittsburg <sup>26</sup>
Rydesky Mines	Emperium, Pa		Prins <sup>12</sup>
Sahara Coal Co. South-East Coal Co. Stoker Coal Co. Sunday Creek Coal Co.	Harrisburg, III. (3) Paintsville, Ky. Scuddy, Ky. Adams Mills, Ohio	300 160	McNally Pittsburg <sup>15</sup> Jeffrey <sup>15</sup> Jeffrey <sup>15</sup> Prins
Truax-Trase Coal Co	Pinckneyville, III. (3). Cerede, W. Va. (4) Pinckneyville, III	200	McNally Pittsburg <sup>16</sup> McNally Pittsburg <sup>16</sup> McNally Pittsburg <sup>11</sup>
Valley Camp Coal Co	Elm Greve, W. Va. (14	140	Delatar Concentrator' Jeffrey!!
V-Day Coal Co.	Danville, III.	35	Roberts & Schaefer <sup>®</sup> Kanawha <sup>®</sup>
Webb Coal Mining Co.	Garrison, W. Va.		Kanawita
West Gulf Coal Co.	Maben, W. Va.	100	Flanawhall   Jeffrey!!
West Kentucky Coal Co. William Aloe Coal Co. Wiscensin Coal Corp.	Madisonville, Ky. Imperial, Pa. Wiscoal, Ky	150 95	Link-Belt Western Machinery <sup>12</sup> Link-Belt <sup>12</sup>
Wise Coal & Coke Co. Woodward Iron Co.	Dorchester, Va. (5) Woodward, Ala	50	Western Machinery <sup>14</sup> Delater Concentrator <sup>1</sup> Jeffrey <sup>13</sup>
	Rayland, Ohio		Peterson <sup>ti</sup> Heyl & Patterson <sup>ci</sup>
Youglogheny & Ohio Coal Co	Marnie, W. Va		Peterson® Heyl & Patterson®
	Marnie, W. Va. (12)	120	Deister Concentrator

\* Includes contracts for Installation of new preparation equipment in existing structures. Where more than one equipment unit was installed, the number, when avail-

unit was installed, the number, when available, appears in parentheses following the plant address.

1. WEMCO Mobil-Mill equipment, including WEMCO double-drum separator.

2. Including McMaily Norton automatic washing according to the control of the control of

cluding McNally Norton automatic washing equipment. 3. Kanawha-Belknap chloride washing equipment. 4. Delster No. 16 Plat-O table equipment. 5. Slurry-recovery plant, including there Delster Concentrator tables and Peterson filter. 6. Including Jeffrey Baum-jig equipment and Bird centrifugal driers. 7. Including R&S Hydroseparator and Super-Airflow equipment. 8. No. 7 SuperDuty Diagonal Deck coal-washing tables with Concentrator. R&B Hydroseparatus equipment. S. No. 7 SuperDuty Diagonal Deck coal-washing tables with Conceaco revolving feed distributors as follows; Clinchfield, 1; DeBardeleien, 1; Youghlogheng & Ohio, 1. 9. Including R&B Hydroseparator equipment. 10. Including McNally Fittsburg rotary breaker, five McNally Brusset vacuum jigs and two McNally Norton automatic

11. Jeffrey diaphragm-jig equipment. Including Bradford breaker and Jeffrey Baum-jig equipment. 13. Jig equipment. 14. Chance sand-flotation equipment, 15. Includ-

Chance sand-dotation equipment, 15. Including Jeffrey Baun-jig equipment,
16. Multi-Louvre drier and paddle mixer,
17. Plant addition utilizing existing Jeffrey
Baum-jig washer and including American
Air Filter cascade-type dust collectors,
Rotocione dust collectors, four McNally
Carpenter driers and two Prins Streamcleaners, 18. McNally Vissac downdraft
heat-drying equipment, 19. McNally Tromp
dense-media equipment with automatic density control, 20. Washing plant, including

Jeffrey jig, Bird filter and McLanahan & Stone crushing equipment. 21. Complete fine-coal plant, including

21. Complete fine-coal plant, including Pangborn dust collectors, 22. Including Mc-Nally Mogul and automatic washers, Mc-Nally Carpenter driers, cyclone thickners and vacuum filters, 23. R&S Hydrotator equipment, 24. Including R&S Super-Airflow cleaning equipment, 25. Three TFR filters for washery by Industrial Engin Construction Co.

Norton unit washer, 27. 26. McNally Norton unit washer, 27. Baughman Verti-Vane heat-drying equipment. 28. Including McNally Norton automatic washer and McNally Carpenter drier, 29. Including McNally Mogul washing and McNally Vissac downdraft heat-drying equipment. 30. C.-M-1 drier equipment.
31. Including 4.090-ton blending bin, NELDCO heavy-media equipment for 83/4, vacuum dilers and water tasks to compare the supplementation of th McNally

NELDCO neavy-ments equipment for \$3.5, vacuum filters and water tanks to remove wood. 32. Including Prins unit washery and Streamcheaner, 33. Unit washer, 34. WEM-CO Mobil-Mill equipment, including WEMCO double-drum separator for three-product operation, 35. Including Link-Belt air-

pulsated jig. pulsated fig.

36. Link-Belt Multi-Louvre drier equipment, 37. Including two McNally Tromp dense-media units, Deister Concentrator tables and flotation unit. 38. McNally Pulso drying equipment. 39. McNally Carpenter driers with vibrating dealiming screens, 40. McNally Pulso special fine-coal plant for ½550 centrifuzed coal.

\*/\*sxt centrifuged coal.
41. McNally Norton automatic rewash unit.
42. WEMCO Mobil-Mill equipment, including WEMCO drum separator and WEMCO coal-dewatering spiral.
43. Peterson TFR filters as follows: Rayland, two, 6x8; Marnie, two, 6x10.

thicker overburden. Additional wheelexcavating equipment was under construction, and scrapers, bulldozers and auxiliary draglines were more widely used. In addition, as previously noted, the stacker, with other possible forms of spoil transporters, received increased study. Along with this, increased attention was given to the problem of increasing dipper and bucket capacity.

Increased power through better en-

gines also was reflected in an increase in the number of successful operations conducted with scrapers and bulldoz-

#### SPOIL HAULAGE

Anthracite turned more and more to spoil haulage as a means of recovering deep veins and basins, and spoil haulage also gained in the bituminous industry. One medium was the tractor-powered scraper, which also can dig and load. Others coming into increasing use are the big truck and the rock wagon. Scrapers and trucks, for example, were major uncovering tools in taking over 150 ft of overburden to bare 90 ft of coal at a western operation. They also were increasingly employed, along with rock wagons, in the East and South.

#### AUGER MINING

Extension of stripping limits by augering with machines up to 4 ft or more in diameter staged another maior advance in 1951. Results for normal good operation continued to be 60 tons or more per crewman per shift, with the upper limit 200 or more.

#### COAL HAULAGE

Though overland belt lines and pipe lines were mentioned occasions ally throughout the year as possibilities, the truck and tractor-trailer remained the backbone of coal transportation at strip mines. Preparation of coal for loading was featured by increased use of compressor-mounted drilling units, including at least one with a front-end broom for cleaning,

The availability of higher-horsepower engines was reflected in a trend toward bigger haulage units, with 70 to 80 tons per semi-trailer still the top. Dumping with independent hoists increased as a result of growing acquaintance with savings possible by taking the hoists off trucks.

# STRIPPING AUXILIARIES

Along with continued installation of modern equipment for providing and distributing power, stripping extended its use of FM radio for better communication, and also expanded its use of carrier-current equipment.

Centralized lubrication of big stripping shovels registered another gain and research into better lubricating practices, resulted in maintenance cuts up to 75%, in addition to savings in lubricants, greater safety and added working time through reduction in breakdowns. In the field of pit drainage, plastic and lightweight aluminum pipe with quick couplings made major gains.

# RECLAMATION

The stripping industry put increased pressure behind its program to reclaim and restore stripped-over holdings. There was increased activity in converting strippings to forage areas, with some operators trying out leveling as a preliminary step. . In addition, a few operators were going even farther by saving top soil and restoring lands to better than original conditions for grain or row crops.

# New Anthracite Preparation Facilities in 1951\*

Coal Company	Plant Location	TPH	Equipment
Beaver Breek Coal Co	McAdoo, Pa Scranton, Pa		H. J. Danisls! Western Machinery!
John G. Connell Ceal Co. Diminick Ceal Co.	Beaver Meadows, P Paxines, Pa		Wilmet <sup>s</sup> Menzies <sup>s</sup>
Floes Coal Co	Minersville, Pa	60	Wilmeti
Gilberton Coal Co	Gilberton, Pa	45	Wilmot
Gien Alden Coal Co	Scranton, Pa. (2).  Kingston, Pa. (7).	140	Monziesi Manziesi
Haven Coal & Supply Co		Pa. (4) 40	Deister Concentrator!
Indian Head Coal Co		350	H. J. Daniels <sup>1</sup>
Kech's Coal Yard	Ravine, Pa	15	Wilmet <sup>1</sup>
Lehigh Navigation Coal Co	Coaldale, Pa. (3) Coaldale, Pa. (2) Lansford, Pa.	120	Deister Concentrator' Wilmot <sup>i</sup> Wilmot <sup>i</sup>
Lecust Valley Coal Co			Wilmet
Mammeth Coal Co. Morea Mining Co. Mountain Top Coal Co.	Mores, Pa	12	Menzies! Wilmet! H. J. Daniels!
Penag Coal Co	Shamekin, Pa	50	Menziesi Wilmetis Wilmetis
Jahn Reter Rhoads Contracting Co. Reidinger Coal Co. Resini Coal Co.	Bowmanstown, Pa. Ashland, Pa. (2) Paxings, Pa.	10 50 7	Delster Concentrator Wilmot <sup>19</sup> Menzies <sup>1</sup> Wilmot <sup>18</sup>
Stevens Coal Co. Sun Valley Coal Co. Swatara Coal Co.	Westwood, Pa Seetch Valley, Pa.	80 40	Wilmet <sup>1</sup> Wilmet <sup>1</sup> Wilmet <sup>1</sup>

Includes contracts for installation of new preparation equipment in existing structures. Where more than one equipment

structures. Where more than one equipment item was installed, the number, when avail-able, appears in parentheses following the plant address. In parenthese following the plant address. WEMCO Mobil-Mill equipment, tables. 2. WEMCO Mobil-Mill equipment, including WEMCO drum separator. 3. Freth-flotation plant, including three Hydrotators

and froth-flotation classifier. 4. Menzies againment. 5. Hydrotator equipment

Wilmot froth-flotation Filmet froth-flotation equipment.
SuperDuty Diagonal-Deck coal-washthles with Concence revolving feetthless: Haven, 1; Lehigh ing tables with Concence revolving feed distributors as follows: Haven, 1; Lehigh Navigation, 1. S. Daniels-Roller heavy-density unit. 9. Type A jig equipment. 10. Type D jig equipment. 11. Simplex jig equipment. dicating that standard heavy-media units can go down to 1 mm successfully. Increased attention also was devoted to closing preparation circuits with cyclones alone, cyclones followed by filtering, and so on. More centrifugal cones of both the hydraulic and mechanical types were installed for removing fines from water. New tables for fine coal featured increased refuse-discharge capacity.

#### DEVING

Both mechanical and heat drying found increasing applications in flowsheets in 1951, with especial attention to cyclone-type thickeners and disk, vacuum and solid-bowl filters for the extreme fines. As a result of more fine-coal washing, downdraft and other thermal driers especially designed for this service, including the travel-ing woven-wire belt, found increasing application. Pulsation was added to at least one downdraft drier to reduce, among other things, carryover of the fines in the exhaust stream. Desliming prior to centrifuging and centrifuging prior to heat drying increased, and consideration was being given to the Dutch radial screen in place of sludge tanks for dewatering fines prior to centrifuging.

#### SIZING AND LOADING

Some additional simplification in sizing-particularly in the total number of primary grades loaded-was accompanied by wider use of vibrating screens in sizing as well as dewatering. Crushing, mixing and blending from special stoker and rescreening plants increased, along with dustand freezeproofing with oil, calcium chloride and other materials, with oil as usual well in the lead. And an increasing number of operators rounded out preparation with tramp-iron removal.

#### OTHER SERVICES

Stainless steel was more widely used for protection against acid water and to prevent rusting of chutes, screens, etc. Improved valves for water lines carrying solids also included both the pinch and orifice types. And maintenance of electrical equipment was reduced by a further increase in the use of positive-pressure filtered air and drawout-type controls for quick replacement. Rust-preventive paints and coatings found wider use. For refuse disposal, the truck moved farther ahead, with greater attention being devoted to special heavy-duty units in place of the ordinary type. Pumping of refuse to both piles and ponds increased, and piling of refuse was improved to prevent ignition and keep out water.

# Preparation

Gains in mechanical cleaning paralleled by increased treatment of fine coal and a further growth in dewatering equipment.

FINE COAL again was stressed in coal preparation in 1951, and with it dewatering and drying of these finer grades, including filtering. Heavy media, flotation and the use of tables registered additional major gains, and heavy media was credited with permitting the mining of coal hitherto thought too difficult to prepare.

# COARSE-COAL CLEANING

Aside from the increase in heavymedia and simplification of the process, coarse-coal cleaning in 1951 was distinguished by additional use of scalping screens, rotary breakers and crushers, including specially designed ring and hammer crushers, to eliminate heavy impurities or break them down for transmission to the washing units, thus reducing picking-labor requirements. Blending of raw coal. particularly at coking-coal plants, again received increased attention. and there was a substantial increase in the number of raw-coal storage bins

to enable plants to operate on a uniform feed and possibly at a lower rate per hour. Many vibrating feeders were installed in preference to reciprocating and apron types. Top size washed staved at 4 in as a general rule, with 6 in or larger the exception.

Interest in duplicate-circuit plants increased, with the goals including greater operating flexibility, reduced breakdowns and a better opportunity for maintenance during the working shift. There also was a substantial increase in plants using up to three or more types of cleaning units for specific purposes, including preparation of the finer sizes by either washing, air cleaning or flotation. With this, there was a significant increase in units for three-product separation.

# FINE-COAL CLEANING

WET TABLES, air cleaners and flotation units marked up additional gains in fine-coal cleaning in 1951. with predrying of coal prior to airtabling showing major benefits. Paralleling this development was increased use of wet-type dust-collection units. Flotation, in addition to handling fresh coal, also was called upon for reclamation from silt or slurry ponds. Heavy media in cyclone equipment was the subject of further study, along with special jigs, upward-current washers and classifers, with evidence in-

# Coal-Mine Safety in 1951

Explosions reverse the trend of recent safety gains, although the industry continues to make progress in preventing roof-fall accidents. Haulage and electricity accidents more frequent in 1951.

By FORREST T. MOYER, Chief, Accident Analysis Branch, USBM

SAFETY IN COAL MINES receded in 1951, and the persistent year-toyear improvement from 1948 through 1950 was reversed. Failure to control the explosion hazard through safe ventilating practices, effective dust controls, and adequate rock dusting ruined what could have been a relatively favorable safety record. Due principally to the large number of deaths in explosions, the 1951 fatality experience was worse than in any other year since 1948. However, controls were effectively maintained over the other leading causes of fatal injuries, and the fatality rate in 1951 was the third-best in the history of the industry.

From nearly complete reports it is estimated that 790 men were killed in coal mines during 1951. Although this was 148 higher than in 1950, the loss of life in 1951 was lower than in any other year except 1950 and 1949 since complete fatality statistics first were compiled in 1910. The larger loss of life may be attributed almost entirely to coal-mine explosions and increased production. The gain from 560,388,000 tons mined in 1950 to 576,509,000 tons in 1951 resulted in a corresponding increase in exposure to hazard.

The fatality rate in 1951 advanced to 1.37 per million tons, appreciably higher than the all-time low of 1.15 in 1950. It also was less favorable than in 1949 but was better than the corresponding fatality rate of 1.54 in 1948, when 999 men lost their lives.

Major Disasters—There were five major disasters (five or more deaths in a single accident) in 1951, and these caused a total loss of 157 lives. This record was the worst since 1947, when six disasters killed 179 men. All five disasters in 1951 were explosions of gas or dust. Four were in bituminous-coal mines and one was in a Pennsylvania anthracite mine. It is noted that each of the disastrous explosions in soft-coal mines was ignited by electric arcs from equipment or

blasting lines. The explosion in the hard-coal mine was initiated by a defective flame safety lamp.

The first explosion disaster (on January 18 in the Burning Springs mine, Kermit, W. Va.) killed 11 men and ended the longest disaster-free period in the history of coal mining-approximately 26 mo following the last previous one (November 4, 1948, at the Nethken mine in Maryland). On March 29 a gas explosion in the Buttonwood colliery, Hanover Township, Luzerne County, Pa., killed 5 men. This disaster was the first in an anthracite mine since December 11. 1947, when 8 men were killed at Franklin mine near Wilkes-Barre, Pa. The third disaster in 1951 occurred on October 15, when 10 men died in an explosion at Bunker mine, Cassville, W. Va. This was followed on October 31 by an explosion in the United Gas No. 1 mine, United, W. Va., in which 12 men lost their lives. On December 21, an explosion in the Orient No. 2 mine at West Frankfort.

Ill., killed 119 men. The loss of life in this explosion was larger than in the Centralia disaster in Illinois during March 1947, in which 111 men were killed. It was larger than in any other disaster since the explosion on May 19, 1928, at Mather mine in Pennsylvania, which killed 195 men.

Gas, dust, and fire hazards—the causes of most major disasters—are present in day-to-day coal mining. Constant and effective attention to safe operating conditions and safe work practices is the only means of control. From incomplete reports, the Bureau of Mines has knowledge of 17 gas or dust explosions and of 14 mine fires in coal mines during 1951. All but five of the explosions and all of the mine fires were "contained."

Bituminous-Coal Mines-At bituminous-coal and lignite mines it was es timated that 690 men were killed while at work in 1951, an increase of 140 fatalities over 1950. The fatal injuries in 1951 occurred at a rate of 1.29 per million tons, 21% higher than the record low rate of 1.07 in 1950. Although both the number and the rate of fatalities were appreciably higher than in 1950, they were the third-best annual figures since complete fatality statistics were first compiled in 1910. Output of soft coal in 1951 is estimated at 535,000,000 tons, or 18,689,000 greater than in

Of the total fatalities in 1951 at soft-coal mines, 626 or 91% occurred

# Coal-Mine Fatalities in the United States During 1951\*

	- Bituminous -		Pennsylv —Anthra		Total	
Cause and location	Fatalities	Rate	Fatalities	Rate	Fatalities	
Underground:						
Falls of roof and face	. 316	0.591	51	1.234	367	0.637
Haulage	. 105	.196	14	.338	119	. 206
Explosions: Local	. 1	.002	4	.097	5	.009
Major	. 152	. 284	5	.121	157	.272
Explosives	. 7	.013	5	.121	12	.021
Electricity	. 17	.032	. 1	.024	18	.031
Machinery	. 19	.035		***	19	.033
Mine fires						
Shaft	. 3	.006	5	.121	8	.014
Miscellaneous	. 6	.011	4	.097	10	.017
Total underground	. 626	1.170	89	2.153	715	1.240
Stripping	. 28	.053	3	.073	31	.054
Surface	. 36	.067	8	.193	44	.076
Grand total, 1951	. 690	1.290	100	2.409	790	1.370
Grand total, 1950	. 550	1.065	92	2.087	642	1.146
Production, 1951 est		00,000	41,50	09,000	576,50	09,000
Production, 1950	. 516,3	11,000	44,01	77,000	560,38	88,000

· Estimated from nearly complete returns.

† Fatalities per million short tons.

in underground workings, 36 or 5% at surface works associated with deep mines, and 28 or 4% at strip mines.

Anthracite Mines-It is estimated that 100 men were killed in Pennsylvania anthracite mines during 1951, 8 more than in 1950 and 9 more than the record low total of 91 fatalities in 1949. Due to the greater number of fatal injuries and the decreased production, the fatality rate advanced to 2.41 per million tons in 1951, a more unfavorable rate than in any year since 1947. The rate of occurrence in 1951 was 15% worse than the all-time low of 2.09 in 1950. However, the number of fatalities was the thirdlowest and the fatality rate the fourthlowest in statistical history.

The unfavorable record in 1951 may be attributed largely to the major disaster and to the greater loss of life from haulage and shaft hazards. At anthracite mines, 89 of the 1951 fatalities occurred in underground workings, 8 at surface works associated with deep mines, and 3 in strip

mines.

Causes of Accidents—Fatality experience in 1951 indicates some degree of improvement in the control of hazards from falls of roof and explosives in underground workings, and in surface works and strip mining. However, as gaged by the fatality rates in the accompanying table, the control over the explosion, haulage, electricity, machinery, and shaft hazards was not as effectively maintained as in 1950. The fatality rate from miscellaneous underground hazards was virtually the same as in 1950.

The percentage distribution of fatal injuries by causes in 1951 differed sharply from that in 1950 owing to the large loss of life from mine explosions. Explosions in 1951 caused 21% of the fatalities, whereas only 1% were so caused in 1950. This distortion can be eliminated only by excluding the fatalities in major disasters before computing the percentages. When this is done, fatal injuries from falls of roof and face comprised 58% of the subtotal compared with 59% in 1950. On the same basis, haulage fatalities comprised 19% of the 1951 subtotal compared with 17% in 1950.

Falls of Roof and Face—At all coal mines in 1951, falls of roof and face caused 367 fatal injuries. The 1951 rate of 0.64 per million tons was a slight improvement over the rate of 0.67 in 1950, when 377 were killed by falls of roof and face.

At soft-coal mines, 316 fatal injuries were caused by this hazard at a rate of 0.59 per million tons, slightly better than the rate of 0.62 in 1950.

In anthracite mining, 51 men lost their lives in roof-fall accidents at a rate of 1.23 per million tons compared with the 1950 rate of 1.32.

Roof Bolting-At the close of the year, 524 large coal mines, all or nearly all with a daily capacity of over 1,000 tons, were using roof bolting. The Bureau's Roof Control Section estimates that roof was being bolted at the approximate rate of 48,000,000 sa ft per month by the end of 1951. Data from 116 West Virginia mines indicate the benefits of roof bolting. These mines in 1948 produced 1.062,-702 tons for each roof-fall fatality. As the use of bolting spread in succeeding years, this figure was increased to 1,368,645 tons in 1949, to 1,706,-759 in 1950 and to 4,056,368 tons per roof-fall fatality during the first seven months in 1951. During January-July 1951, the 116 mines accounted for 43% of the total commercial tonnage mined in West Virginia.

Despite such clear evidence of the advantages of roof bolting, there has been no appreciable industry-wide improvement in the roof-fall rate. The 1949 rate was 0.68, in 1950 it was 0.67 and in 1951, 0.64. However, in West Virginia the roof-fall fatality rate was reduced from 0.75 per million tons in 1950 to 0.57 in 1951.

Underground Haulage—Mine cars and locomotives caused 119 underground fatalities at a rate of 0.21 per million tons. This was 4% less favorable than in 1950, when 111 men were killed in haulage accidents.

In bituminous, 105 men lost their lives in underground haulage accidents, the same as in 1950. Because of increased production, the rate of occurrence of these fatalities in 1951 was reduced slightly to 0.20. In anthracite, haulage accidents in 1951 killed 14 men, against 6 haulage fatalities in 1950. The larger number and smaller production resulted in a fatality rate of 0.34 per million tons in 1951 which was appreciably worse than the corresponding rate of 0.14 in 1950.

Gas and Dust Explosions—Of nine explosions of gas and dust which caused loss of life, 5 were major disasters and 4 local explosions. In all, 162 men were killed by mine explosions, a sharp contrast to totals of 8 in 1950 and 8 in 1949. The fatality rate of 0.28 per million tons in 1951 was the same as in 1947, when 189 men were killed.

Four of the major explosions and one of the local explosions were in bituminous-coal mines. The major explosions killed 152 men and the local explosion killed 1 man. In anthracite. one major explosion had a fatality toll of 5 and three local explosions killed 4 men. In addition to the foregoing, 7 other explosions have been reported to the Bureau. The 17 explosions caused 162 fatal and 31 nonfatal injuries. Moreover, there was an explosion of coal dust on the surface, when a man was killed while doing electric welding in the tipple.

Explosives—Despite probable increased consumption of explosives, the fatalities charged to their use and handling were reduced to 12, or 2 less than in 1950. Fatal injuries from gas or dust explosions in which explosives may have been a contributing factor are not included here. As a direct cause, explosives killed 7 men in soft-coal mines in 1951 at a rate of 0.01 per million tons, an improvement over the rate of 0.02 in 1950. At anthracite mines, explosives killed 5 men at a rate of 0.12 per million tons compared with 0.09 in 1950.

Electricity-Electricity was the direct cause of 18 underground fatalities in 1951-four more than in 1950. In bituminous, 17 of these fatalities occurred at a rate of 0.03 per million tons, which was less favorable than in 1950. In anthracite, one fatality occurred in 1951, and one in 1950.

Machinery—The 1949 and 1950 progress in the safe operation of machinery was set back somewhat in 1951. Machinery killed 19 men underground at a slightly higher rate than in 1950, all in soft-coal mines. The rate was 0.04 compared with 0.03 per million tons in 1950. There were no fatal injuries from machines in anthracite mines in either year.

Other Cases—Of the total fatalities, 88% resulted from the foregoing causes. The remaining 93 resulted from a variety of minor causes in underground work, strippings, and in surface work at deep mines.

Stripping Safety, both bituminous and anthracite, was improved in 1950. The record was 31 fatals at a rate of 0.05 per million tons compared with 40 fatalities at a rate of 0.07 in 1950. In surface works at deep mines, 44 men were killed at a frequency of 0.08 per million tons. This was an improvement over 1950 in both bituminous and anthracite.

Non-Fatal Injuries—Non-fatal lost-time injuries at all mines in 1951 add up to an estimated tentative total (based upon the experience of reporting companies during the first 10 mo. of 1951) of 38,250 and a frequency of 66.35 per million tons. The estimated bituminous total of 31,000 injuries represents a rate of 57,94 compared with 54.97 in 1950. The tentative total of 7,250 injuries in anthracite had a rate of 174.66 per million tons of clean coal compared with a rate of 200.90 in 1950.

HUDSON COAL'S TIMBERING MACHINE lifts leg
(right) and collar (far right)
into position in a high gangway. A parallel bar on the
boom holds the timber saddle
in an upright position at any
boom angle, and a ratchet
and dog prevent the boom
from collapsing unexpectedly.





# **Shop-Made Unit Sets Timbers**

2% Spare Parts + 98% Ingenuity = Better Timbering

PERHAPS it was the presence of a battery-powered locomotive, equipped with Edison batteries that brought about the foregoing modification of Mr. Edison's famous quotation, "Genius is 2% inspiration and 98% perspiration." In any event, Superintendent W. I. (Wes) Stonebreaker's maintenance department at Olyphant colliery, The Hudson Coal Co., Olyphant, Pa., which is under the immediate supervision of August (Gus) Ollendike, maintenance foreman, showed 98% ingenuity in producing a timbering machine that could be hauled by a locomotive and powered from its batteries.

The new machine, designed and nurtured through construction by Mr. Ollendike, speeds timbering operations, eases the hard work of placing heavy timber sets in high openings, eliminates scaffolds and is able to work independently of the mine electrical system.

The unit consists of a mine truck which carries a rotating platform to which is hinged a telescoping boom for placing the heavy legs and collars. The telescoping boom, made of two lengths of steel pipe, 3½-in and 4-in, enables the machine to work in places from 10 to 18 ft high and to handle timber up to 16 in in diameter and up to 18 ft in length.

The boom is raised and lowered by cable from a salvaged cable-reel drum which is driven by a 250-v DC motor and gear reducer from an old pit-ear loader.

The gear reducer eliminates the need for a brake in holding the loaded boom in an elevated position, and a ratchet and dog prevent unexpected collapse of the boom. Electrical outlets on the machine permit the use of a portable electric saw and drill.

Before the machine was placed in service about a year ago, a crew of from four to six men was required for timbering in openings 10 ft or more in height because scaffolding had to be built and timbers had to be manhandled into place. With the machine, however, only three men are required.

Another distinct advantage is the ability of the batterypowered machine to work in places where trolley wire has been removed or where power has been disconnected from the wire.

The locomotive is equipped with 140 nickel-iron-alkaline Edison A8 cells, many of which were put in service 20 yr ago in main-haulage locomotives. In this lighter duty, the machine has worked for as many as nine 7-hr shifts on a single charge.

Charging current is taken from the 250-v DC electrical system in the mine and, other than polarized quick connectors, the only charging equipment required is an adjustable rheostat in series between the DC source and the batteries. During the charging period the rheostat is manually adjusted by the locomotive operators.



MAINTENANCE FOREMAN OLLENDIKE, in the white cap, checks the performance of the battery-powered unit.



Wide World photo

ONE WHO ESCAPED-rescue workers carry miner out of Orient No. 2 mine following explosion taking 119 lives.

# Orient and Its Lessons

Orient No. 2 men didn't expect an explosion. You don't expect an explosion either. But Orient shows that it can happen. You may not be as safe as you think.

W. Frankfort, Ill. Dec. 24 (Special) -Rescue workers today brought out the last of 119 killed in the Orient No. 2 explosion a few minutes before 8 pm, Dec. 21. Of the 257 men in the mine at the time, 133 escaped to the surface uninjured and unaided. four were 'rescued and hospitalized, and one, who survived, was rescued 58 hr after the blast. One of the four injured men later died in the hospital. The dead left behind a total of 301 dependents.

# **Looking Back**

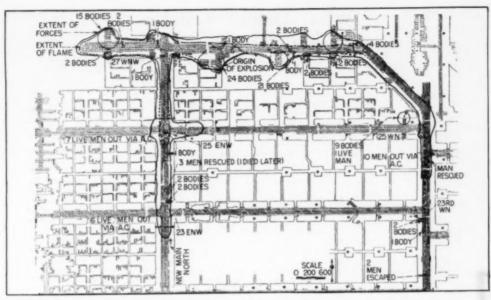
UNTIL THE EXPLOSION in an area approximately 6 mi north of the main hoisting shaft, Orient No. 2 mine of the Chicago, Wilmington & Franklin Coal Co., at W. Frankfort, in the Franklin County field of southern Illinois, had had a long history of high production with high efficiency and low rate of injuries and loss of life.

Construction of Orient No. 2, also known as New Orient for many years prior to the construction of Orient No. 3, at Waltonville, began in May, 1921. It was deliberately designed as a big mine-even bigger than its predecessor, Orient No. 1, which also is still operating. Orient No. 2 still holds the record for coal hoisted in a day-13,563 tons on Nov. 3, 1926. Present daily output, with approximately 1,100 men, is 10,000 tons.

Mining the Illinois No. 6 seam under approximately 500 ft of cover, Orient No. 2 had extended its workings more than 6 mi north from the hoisting shaft at the time of the explosion and had sunk No. 4 shaft for men and ventilation a short distance southwest of the explosion area. The panel plan of mining was instituted with the opening of the property. Equipment in the explosion area included loading machines, shuttle ears, gathering and relay belts, and locomotives.

The panel plan presently being employed involves turning stub entries off the main panel entries. Relatively short rooms then are turned off the stub entries and driven parallel to the panel entries. Room pillars customarily are slabbed to increase recovery. When operations are completed in one group of rooms, the loading unit drops back to the next stub entry, leaving a thin pillar.

Orient No. 2 is classed as gaseous by the State of Illinois. Consequently, operating measures include closed lights and a ban on smoking or smoking materials. One previous major explosion occurred on Jan. 29, 1926, claiming 5 men. Otherwise, the mine had been free of major disasters though a local explosion in 1947 killed 3 men. In 1950, Orient produced 1.936.762 tons with but one fatality and 39 injuries causing men to lose 7 days' time or more, according to the annual report of the Illinois Department of Mines and Minerals. On this basis, the 1950 fatality rate was 0.52 per million tons, compared to 0.79 for Illinois and 1.077 for the bituminous industry as whole. The non-fatal rate for Orient No. 2 was 20.13 per million tons in 1950, compared to 28.44 for the state.



WHERE EXPLOSION TOOK ITS TOLL-map of the portion of Orient No. 2 mine affected by the blast Dec. 21.

# **Pre-Explosion**

Orient No. 2 mine operates under the master bituminous wage agreement embodying the federal safety code. Art. V, Sec. 9a, of the code provides that: "Abandoned workings shall be sealed or ventilated. The sealing or ventilating of abandoned workings shall be governed by the law or practice in the state where the mine is operated."

Sec. 9d provides that: "Air that has passed through abandoned sections or that has been used to ventilate pillar lines shall not be reused to ventilate live workings. Mines that cannot comply with this requirement may continue to operate as at present until future mine development and ventilation can be changed to permit compliance with this section."

The sealing point became an issue immediately after the explosion, with the director of the Department of Mines and Minerals declaring that Illinois considered it safer to keep panels open and ventilate.

The bituminous wage agreement also provides that a safety committee shall be set up at each mine by the local union, with duties as follows: "The mine safety committee may inspect any mine development or equipment used in producing coal. If the committee believes conditions found endanger the life and bodies of mine workers, it shall report its findings

LEGEND
BODIES
FORCE ARROWS

31'
COKED AREA

LOADING MACHINE
POST-MOUNTED DRILLS
COKED AREA

COKED AREA

EXPLOSION ORIGIN—3 and 4 South panel off 27 East North West, fixed as the probable origin of the blast.

and recommendations to the management. In those special instances where the committee believes an immediate danger exists and the committee recommends that the management remove all mine workers from the unsafe area, the operator is required to follow the recommendation of the committee." No evidence was offered

that such a recommendation was made in connection with the conditions at Orient No. 2.

Some 25 examiners, all members of the United Mine Workers and all certified by the State of Illinois, are employed at Orient No. 2. Preshift, onshift and weekly examinations for gas and other hazards are made by

# What Orient Teaches

The Orient No. 2 disaster, as could be expected, generated numerous suggestions and considerable pressure for new and stiffer laws to prevent a repetition. No one can quarrel with the principle that there should be a proper legislative foundation for mine safety, though there is equal reason for opposing the wrong kind of laws, especially of the agency-or bureau-made type. The logical course is for the industry to accept leadership in safety, write or cooperate in writing the laws, and organize for carrying out their provisions, and for the more important job of promoting safety by all possible means.

Laws as such, in other words, cannot guarantee that most vital ingredient of all: the conviction in the mind of every individual that the goal is right and proper and that every possible step should be taken to achieve it. Basically, the majority of the men having to do with coal mining—management, workers and all others—have yet to really appreciate the killing power of mine hazards, whether they be roof falls or open flames or sparks in combination with gas or coal dust, met with in mining not in cubic feet or ounces but in thousands of cubic feet and millions of tons. To that extent, in the broader sense, the responsibility for Orient, and for all mine disasters and accidents, must be shared by all men having to do with coal mining.

Where explosions are concerned, wholehearted acceptance of responsibility points logically to the steps that should be taken. They include:

# **Providing Air**

Fresh air, in the right quantity, at the right place, and at the right time, is the first line of defense against gas ignitions. If these conditions are met, the gas is diluted to the point where it cannot be ignited, thus removing one of the basic ingredients in an explosion.

This involves much more than merely putting a sufficient quantity in the mine. Positive measures must be taken to get it to the face, keep it pure while passing through the live workings, and direct it straight into the return after it has served its purpose. Along with other steps, the mining plan is a major factor. There are a number of ways in which mining plans can be made to serve in achieving these objectives, including splitting and overcasting and a form of development that always insures coursing away from live workings.

# **Preventing Ignition**

With electrical equipment the backbone of coal mining, complete elimination of ignition sources is a most-difficult task. The number can be sharply reduced, thus backing up good ventilation, by installing the proper equipment and maintaining and operating in the safest-possible condition. Parallel goals are the elimination of fire hazards, open lights and smoking.

# Controlling Dust

Bituminous coal dust can be ignited directly and almost always figures in bituminous explosions. The remedies are clear:

 Control of dust at the point of production by sprinkling, spraying or otherwise to keep it out of the air and permit ready removal from the mine with the larger coal.

2. Rockdusting to prevent the ignition of dust and limit the spread of explosions. The goal should be a safe incombustible content everywhere in the mine at all times. It can be done with generalized rockdusting, though in this the human element is a major factor. There is real need, therefore, for active investigation into other possible ways of doing the job so that protection becomes as near automatic as possible. Among the possibilities are the bag system or new types of barriers.

# **Putting Safety First**

Air and dust can be sampled. Machines can be tested for permissibility. And concrete steps can be taken to eliminate physical hazards. In this area, management alone is responsible for safety.

Yet nothing can alter the fact that safety consciousness, resolution and teamwork still are the foundations of safety. Safe equipment alone will not save men's lives. Nor will any law create the right mental approach.

Safety still rests in the minds and hearts of men. From the top office of the company and the union all the way down the line to the face boss and the worker, the real need, individually and collectively, is vigilance, teamwork and the will to make safety stick. Management has its role to play, and the union and the mineworkers have theirs. Together, they can move forward to the goal.

the examiners and the various foremen, and "safety-first-men" are stationed in working sections to keep a constant check on gas in "old ends," or abandoned and caved working sections. Two such men were killed in the explosion.

#### STATE INSPECTION

Oct. 4, 1951-James R. Wilson and Murrell Reak, state inspectors, conclude examination of Orient No. 2 mine and report that: "In our judgment, it is safe to operate this mine."

Dec. 11, 1951-Inspector Wilson concludes 7-day inspection and reports ventilation "good," other conditions "fair" and the mine "95%" rockdusted.

## FEDERAL INSPECTION

July 31, 1951—Inspectors W. R. Chick and C. L. South conclude inspection covering the dates of July 10-13, 16-20, 23-27, 30 and 31. Their recommendations to correct "Violations of the Federal Mine Safety Code" included:

"Abandoned workings should be sealed or ventilated" (sixth consecutive listing of this recommendation).

"Air that has been used to ventilate

the edges of abandoned room-panel entries should not be reused to ventilate live workings" (fourth).

"Rock dust should be maintained in such quantity that the incombustible content of the mine dust will not be less than 65%, plus 1% for each 0.1% of methane in any ventilating current" (third).

"The underground employees should discontinue the practice of carrying matches or other flame-making devices into the mine, and they should cooperate with the management in enforcement of provisions in the code" (third).

#### BLACK FRIDAY

After fog the previous night, Dec. 21 was clear and fair. The barometer, after reaching its low the previous midnight, rose throughout the day. Rockdusting every day is the practice at the mine and the panel where the explosion originated had been rockdusted the night before. In fact, rockdust still was in place in many parts of the affected area after the explosion. There were no major temperature changes and no ventilation interruption.

No unusual occurrences were reported immediately before or during the first shift in the mine or in the area where the explosion occurred: the 27 and 28 West cross entries and contiguous workings. The mine examiner's records showed working and caving in some abandoned sections, with the book carrying this entry:

"The 1 and 2 East and 5 and 6 South 27 West North is on the move and falling, Clear as far as I could get." Abandoned places in 3 and 4 South 27 West North West also were reported working and gas was found Dec. 18-21 in 3 and 4 North 27 West North.

In 3 and 4 South 27 East North West panel, where the explosion apparently originated, the mine examiner for the first shift Dec. 20 reported: "The 3 and 4 East 3 South 27 East New Main North is working and falling this morning. Gas in Rooms 1, 2 and 3." The same examiner reported as follows Dec. 21: "The head end and 3 and 4 South 27 East New Main North is unsettled and falling. Clear as far as I could get."

A gas watchman was assigned to the day shifts on Dec. 20 and 21 to watch the abandoned workings inside Stub Entry 3 in 3 and 4 South. The examiner for the night shift, who made his rounds at approximately 5 pm, did not report gas in 3 and 4 South but stated afterward that the inby workings were unsettled and falling.

The night shift entered at No. 4 shaft at 6 pm, with four crews-Clark, Reach, Southern and Zanzuchischeduled for the explosion area. The mantrips left the shaft bottom about 6:25, taking 20 to 25 min to reach their various sections, exclusive of walking time. The explosion occurred within a few minutes after work began. In the probable explosion panel, the Zanzuchi crew, for example, had two shuttle cars loaded and waiting for an empty trip, which was passing through the door in the 45 at the mouth of the panel when the blast occurred. Two timbermen had been sent up to the edge of the old works to set additional supports.

# The Findings

John L. Lewis, president, United Mine Workers (Dec. 28, after an 8-hr inspection Dec. 27)—"Abnormal" gas situation resulting from squeezing "overrode" normal precautionary measures, including ventilation and rockdusting. "The advance explosion situation was sufficient to warrant keeping men out of the area and steps should have been taken to keep the miners out of the mine." Miners "depend upon management" for protection against unsafe conditions. "Unquestionably there was laxity in dealing with the situation."

U. S. Bureau of Mines (Jan. 8)-Representatives of the U. S. Bureau of Mines who investigated the disaster are of the opinion that the explosion probably originated near the junction of 3 South of 27 East North West and No. 3 stub entry off 3 South; that the disaster was caused by the emergence of a large body of explosive gas from an abandoned and caving area resulting from the combined effect of caving in the abandoned area and simultaneous short-circuiting of the ventilating current; that the gas was ignited by an electric are or spark from nonpermissible electrical equipment; and that the propagation of flame throughout a large part of the affected area of the mine was by coal dust and possibly by gas from other worked out and abandoned areas."

Cigarettes were found near the bodies of the two timbermen against the caving area in 3 South-one of the points where the gas is believed to have been emerging from the worked-out area. "There is no evidence that the men were smoking or lighting cigarettes at the instant of the ignition and a thorough search of the immediate location failed to reveal the presence of matches or cigarette lighters." In its flow from the caving area, the gas followed the air to the working places off No. 3 stub entry, first passing two shuttle cars waiting to unload. However, two post-mounted drills in nonpermissible condition were in operation in No. 2 room and are believed to have been the ignition source.

"Conditions considered responsible for this disaster are:

"I. An inadequate ventilating system in which the air that ventilates the open approaches to abandoned and caving areas is coursed therefrom to active working places or haulage roads and in which provision has not been made to keep abandoned areas free of accumulations of explosive gas.

"2. The operation of nonpermissible electrical equipment, capable of igniting gas, in return air from the open approaches to abandoned and caving areas containing large accumulations of explosive gas.

"3. The presence of large accumulations of fine coal dust created by mining operations. This coal dust, principally along the roadways, was not removed from the mine or rendered inert by the application of sufficient rockdust."

Illinois Department of Mines and Minerals (Jan. 8)—The explosion originated in 3 and 4 South off 27 East North West and was caused by ignition of methane. "It is believed the body of methane... was liberated in the abandoned ends of 3 and 4 South panel workings and moved outward from the abandoned workings to the area where it was ignited." The movement was a result of roof falls creating pressure in the abandoned ends, or a short-circuiting of the ventilating system caused by an empty trip blocking open a door between the intake and the return. The explosion was carried on by coal dust.

The most likely sources of ignition were (1) operation of the locomotive coupled to the loaded trip at the loaderhead or (2) men smoking near the caved area. The bodies of two timbermen were found at this loca-tion and "two whole cigarettes and several parts of a number of cigarettes apparently torn to pieces by the explosion, were also found on the floor near the bodies," and "the top of a cigarette package containing one cigarette was burned by the flame. Flame markings on the roof radiated outward from this point, along with force, according to the direction the stoppings were blown out.

Recommendations included the following: (1) laboratory analysis of dust samples and insistence by inspectors on adequate rockdusting; (2) cleaning up of all accumulations of loose coal and coal dust: (3) ventilation so that the air reaches the working faces without interruption; (4) elimination of doors if possible or, if not possible, their use in pairs to form airlocks; (5) testing for methane with a flame safety lamp before electrical equipment is taken inby the last crosscut, before it is operated at the face and after the coal has been broken down; (6) strict adherence to the no-smoking law; (7) pending the development of a safer plan of mining, removal of all men from squeezing areas until the squeezing is over, dangerous quantities of gas are no longer present, and the mine examiners have reported the area safe. The working shifts may then return to the panel provided a certified examiner is assigned to make continuous examinations of the affected area during the working shifts.





LIGHT WEIGHT for operation on slopes and planes was the major factor in adop-HALF THE WEIGHT; tion of aluminum cars for Dosco mines. Other advantages are resistance to wear and STAND UP BETTER corrosion, self-cleaning and increased ability to withstand service stresses. A 3-ton aluminum car weighs 1,920 lb; the same-size steel car, 3,750 lb.

How Dominion Coal Is Boosting Haulage Efficiency With . . .

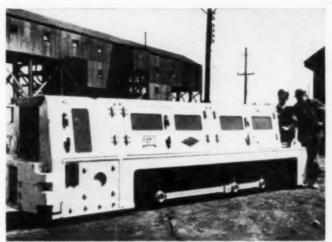
# Aluminum Cars and Diesels

Moving dead weight costs money, especially on pitches. Dominion Coal felt that part of the answer might lie in aluminum mine cars if they could take it. Two test cars installed nearly 4 yr ago proved they could. Now Dosco is equipping all its collieries with aluminum cars, and is further enhancing safety and efficiency with diesel haulage locomotives.





SERVICE VETERAN-One of the first pair of aluminum cars tested at No. 20 colliery. After nearly 4 yr, tear in corner is only major damage to aluminum, while experimental steel parts are badly rusted.



#### **NEW POWER**

READY FOR SERVICE-100-hp diesel locomotive at No. 18 colliery before being sent below for operation on cross-measure tunnel pulling 20-car trips to the FOR HAULAGE on cross-measure tunner puring accent the slope bottom. Weight is 15 tons; rated speed, 15 mph.

ALUMINUM MINE CARS and diesel-haulage equipment have given so good an account of themselves in initial installations at mines of the Dominion Coal Co. Ltd., Sydney, N. S., that the cars will be installed in all the mines operated by all the subsidiary companies of the Dominion Steel & Coal Corp., Ltd., the parent company, while die-

sel-haulage units will be placed in those collieries where locomotive haulage is possible.

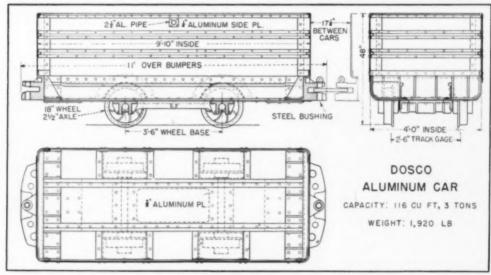
Both the aluminum cars and the diesel locomotives represent a search for improved haulage equipment going back a number of years. The aluminum cars were chosen because their light weight is of major value in operation over

slopes and planes, necessary in practically all Dosco collieries because of pitches. Diesel locomotives were selected in an effort to eliminate open wiring underground, thereby promoting safety and eliminating the cost of installation and maintenance, and because it was felt that the locomotives themselves would be simpler and safer to operate, easier to maintain, and would contribute to a lower over-all haulage cost.

#### Aluminum Cars

The initial aluminum-car installation at a Dosco colliery was at Dominion No. 20, Glace Bay, N S., Angus MacDonald mine manager. Two cars were installed Nov. 28. 1947, for experimental purposes. They were put in with the original steel cars to see if they could take it. They are still in regular service and show few signs of wear or damage as far as the aluminum parts are concerned. On the strength of the results attained with these first two cars, the decision has been reached to standardize on aluminum cars at all Dosco collieries.

Since the first two cars were hand-built, and since they were for test purposes, the design and construction differs somewhat from the production model now being installed. One of the two was built with steel side sills, steel bumpers



DESIGN AND DETAILS, Dosco aluminum car-116 cu ft, 3 tons, 1,920 lb.

#### Aluminum cars prove worth at Dominion Coal operations . . .





ALUMINUM PLATES, castings, pipe and extrusions feature production cars, which weigh only half that of a steel car of corresponding capacity. Steel is used only as bushings for pins and for the running gear.



CAR USER AND DESIGNER-D. Murray (left), mine manmechanical engineer, Dominion Coal Co., Ltd.



SAFETY AND ECONOMY underlie Dosco choice of diesel ager, Dominion No. 18 colliery, and J. A. Russell, chief locomotives for level haulage underground. This is the first production unit at No. 18 colliery.

and draft members, a steel bottom planes is regular mine practice. plate, steel gussets and steel angles for rub rails inside the body and as beads around the top. Assembly was by aluminum rivets. The second car was similar in construction except that aluminum was substituted for steel in the bottom plate.

#### **CARS PASS EXTENSIVE TESTS**

The two cars were put in line with 2- to 2½-ton steel cars. Among other things, they are hauled in trips of 60 cars with 20ton electric locomotives and dumped in a rotary dump at the bottom of the skip shaft. They normally receive their coal from loading conveyors in roadways serving walls from which most of the Dosco output is derived in the Sydney area and elsewhere. Since pitching coal is the rule, operation on slopes or

After approximately 2 yr, aluminum bumpers and axle pads were substituted for the steel members on one of the cars. One of these aluminum bumpers was cracked and replaced. Redesign in the production-model cars has made this about the only instance of such damage to date. The only other trouble of any consequence was breakage of the pedestals by the horns of the rotary dump. These also have been redesigned and, consequently, this difficulty has been practically eliminated.

As noted, the first two cars still are in regular service at No. 20 mine, and repairs other than those previously listed have been practically nil. A few rivet heads have been rubbed off and some holes have been put in the side sheets by

pick blows by miners of an inquisitive or experimental turn of mind, and at least one car has a short tear where the plate was bent around one corner. Aluminum extrusions now are used for corner

There is practically no evidence of wear or corrosion in the aluminum members in nearly 4 yr of service. The water is mildly acid. In contrast, the steel bumpers, sidesills, gussets, stiffeners and other steel parts show scaling of 1/8 in or more and appear much the worse for wear. Colliery officials also point out that the aluminum cars have stood up with practically no injury in wrecks that have severely damaged steel cars.

As a result of experience with the first two cars at No. 20, a 3-ton aluminum model identical in all respects except for track gage, has been standardized on, as noted, for all collieries operated by Dosco coal-producing subsidiaries. The first 75 of the production type went into service at Dominion No. 18—D. Murray, mine manager—in December, 1949. No. 12 colliery next received 300, with 250 more being delivered at the time this article was written. Mine manager at No. 12 is Adam Forsyth.

#### VARIED SERVICE ADVANTAGES

The major consideration in going to aluminum was decreased weight—a vital factor in view of the predominance of slopes and planes. Weight of the 3-ton aluminum car is 1,920 lb. In comparison, weight of the 3-ton steel car previously used at No. 18, for example, is 3,750 lb. For the same coal capacity, therefore, the weight of the car is cut almost in half.

Other advantages, some expected and some discovered in the course

of service, are:

 Resistance to wear and abrasion. As noted, the first two cars show practically no wear after nearly 4 yr of service.

Resistance to corrosion, including corrosion from the salt atmosphere encountered in operation along the open Atlantic Coast.

 Self-cleaning. Experience has shown that wet coal has little or no tendency to stick to aluminum, while considerable trouble is encountered with steel.

4. Ability to absorb vibration and, consequently, resist splitting and tearing of the sheets when breaks occur. For example, with a steel car a break in the bead angle at the top of the car is followed by splitting of the sheet to the bottom if the car is kept in service. This does not occur with the aluminum car.

The aluminum, however, can be scored or gouged easily, though little trouble has been encountered in this respect. About the only change in practice that has been necessary is care in installing rubbing strips at turns at the bottom or top of slopes and planes. These now are made of hardwood faced with canvas, with no projecting nail or bolt heads. As a result, the only effect when a car does strike a rubbing strip is polishing of the metal.

The cars are supplied by the Eastern Car Co., Ltd., a Dosco subsidiary. Strength members, such as the bumpers (which include carhaul dogs), pedestals and the like, are cast aluminum. Side and end sheets are 1/4-in aluminum plate; bottom sheets, 3/4-in. Tram or side sills and top reinforcing beads are extruded angles or zees; corner posts, rub rails (inside stiffening members) and certain other parts are extruded shapes. Extrusions are low-cost compared to special rolled shapes. Thickness of the corner posts is 1/2-in. Fabrication is by aluminum riveting. Steel Fig. 8 links and pins are employed, and to accommodate the pins steel bushings are pressed in the bumpers. This was a change made as a result of wear encountered with the test

Car dimensions are as follows: height over rail, 48 in; depth inside, 38½ in; width inside, 48 in; length inside, 9 ft 10 in; length over bumpers, 11 ft; wheelbase, 42 in. Nominal capacity is 116 cu ft, or 6,050 lb; weight, 1,920 lb.

The cars are equipped with 16in cast manganese-steel wheels, supplied by Maritime Steel & Foundries Co., Ltd., New Glasgow, N. S., and Timken bearings. Axles are Dosco CPR special fine-grain 0.45 carbon steel.

#### Diesel Haulage

Satisfactory experience with the initial diesel locomotives at Dominion No. 18 colliery is being reflected in additional installations at other Dosco properties. The first installation-an experimental unit which was retired from service after the tests were completed and returned to the manufacturer for rebuilding-was the culmination of a long search by Dosco officials for a locomotive that would weigh not less than 15 tons, be rated at not less than 100 hp and would not be over 5 ft high. It was found in the North British "Miner."

#### 20-CAR TRIPS HAULED

As noted, the first unit was experimental and was retired when tests were completed. The second. or production, machine-the forerunner of others now scheduled or to be acquired in the future-went into service at No. 18 colliery July 1, 1950, and is performing with complete satisfaction. The duty is hauling 20-car trips of aluminum or steel cars 1,200 to 2,000 ft through a cross-measure tunnel with a grade of 0.5% in favor of the loads. Maximum trailing load is approximately 130 tons with steel cars and 110 tons with aluminum cars; trailing load empty is approximately 38 tons steel and 19 tons aluminum.

The locomotive is a two-axle unit rated at 15 tons deadweight. It is powered by a 100-bhp Crossley BWL 5 5-cylinder in-line diesel engine with three-speed mechanical transmission providing rated speeds of 3, 6½ and 15 mph. Maximum engine speed is 1,250 rpm; idling, 300 rpm. Side rods provide traction on all four wheels. Tractive effort, 25% adhesion, is 8,400 lb. Minimum radius of curve, 4-ft 7-in wheelbase, is 60 ft. Wheel diameter is 24 in.

Length over the bumpers is 15 ft 1 in. Maximum height is 4 ft 5 in; width, 4 ft.

#### SAFE OPERATION EMPHASIZED

The machine is equipped with a water-type exhaust conditioner. The water is changed daily, and the sprays are changed every 3 wk for reconditioning. The cleaning schedule is every 2 wk for the conditioner.

The conditioner is followed by a double flame trap of the Lessingring type, which is changed every shift and cleaned by boiling in soda and blowing out with compressed air. A single Lessing-ring flame trap is installed on the air intake. After leaving the conditioner and flame traps, the exhaust is mixed with air from the radiator fan and is discharged through the front and sides of the locomotive. Other equipment includes Westinghouse air brakes, air sander, air starting equipment and air horn, in addition to electric headlights powered by a small generator.

Provincial regulations governing operation of diesel locomotives underground include analysis of the air at each end of the haulway once a week; tests every 24 hr if the gas content reaches 0.75% and for 6 days afterward; termination of locomotive operation for as long as necessary if the percentage reaches 1.25; weekly reports of tests to the provincial inspection department; examination of the locomotive every 24 hr; sampling of the exhaust every month and termination of operation and correction of defects if CO is over 5 parts per thousand; and use of a fuel with a flash point of not less than 150 F. British Standard Specification 209.

Between July 1, 1950, and Feb. 8, 1951, the No. 18 locomotive hauled, in addition to men and material, 87,097 tons of coal and 4,336 tons of stone. Total mileage was 5,158. Mileage per gallon of fuel was 2.57.



#### TOTAL RESTORATION KEEPS LAND FERTILE

VISUAL PROOF—Grassy field (left), with topsoil restored and leveled in the summer of 1950, was planted in winter wheat the following October, and after harvest in July, 1951, was planted with clover. Field at right leveled last summer was planted with winter wheat and timothy in September of last year.

#### RECLAMATION BY LAW ADDS LITTLE VALUE

in contrast—At this pit not far away, considerable money was spent for leveling according to law, but the land still will have no taxable value. The pit is still open, topsoil was not kept separate for return to the surface, and it is likely that during the winter deep ditches will erode in the slope at the left.

## Here's How You Can Return Strip Lands to Full Fertility

WITHOUT DAMAGE to their farms, and with actual improvement in some cases, several farmers in the vicinity of Cadiz, Ohio, have realized neat sums of money by selling underlying coal for strip mining with the stipula-

tion that the land be totally restored. Such total reclamation is practicable only for farms with natural favorable conditions, and the owner also must sell the coal at a lower royalty than if the mining company were obligated to restore the land only to the extent of the strip mining law. C. C. Fay, of Cleveland, owner of the Rail & Lake Coal Co., has been a pioneer in total reclamation and to date has restored 400 acres of land he has stripped. His





STRIPPED LAND restored last summer. Winter wheat coming through will form a root lock to minimize erosion and provide a valuable crop this June or July if the season is favorable. Low pile along the left side of the spoil bank (right photo) is good topsoil and subsoil set aside for return to surface. Restoration of smooth ground has been completed.



With favorable soil conditions and help from a lower royalty, stripped farms are as good-and some even better-after total restoration, Rail & Lake experience shows.

equipment is highly mobile and thus especially well suited to conditions where total restoration is practicable.

#### **ECONOMICS IMPORTANT**

stripping since 1926, has learned by experience a great deal about reclamation and its economic limits. His interest in the subject came about be-CONOMICS IMPORTANT cause in the early years of World Mr. Fay, who has worked with coal War II he wanted to keep certain

equipment busy temporarily until needed in another strip pit and, therefore, put it to work leveling 200 acres that he had stripped without previous thought toward restoration. The money he later spent on that 200 acres for special plantings, fertilizers and the like to completely restore fertility added up to far more than he would have spent if he had kept the top soil separate and spread it on top of the leveled ground.

The Rail & Lake Coal Co. produces 1,000 tpd from two pits near Cadiz, delivering by trucks to a screening tipple on the Wheeling & Lake Erie Branch of the Nickel Plate System at East Cadiz. The truck haul of about 5 mi is contracted and the loading is from only one pit each day. The tipple is equipped with a crusher and can prepare six sizes. Practically all the coal goes to steam markets.

#### MOBILE UNITS PREFERRED

Equipment is limited to a size that can be moved without high expense. The largest stripper is a Marion 40A crawler - type Buda - diesel - powered dragline with 85-ft boom and a 3-yd P&H bucket. With the boom and counter-weights dismantled, the machine can be moved on a lowboy. This dragline is operating on the Morgan grant at the edge of Cadiz, where all photographs were made ex-cept that showing only "legal" restoration.

Other equipment at this Morgan grant includes: one Marion 380 highlift shovel, 32-ft boom, 2-yd Marion dipper, Buda - diesel - powered, used for both loading and stripping; one Caterpillar D-7 tractor with LeTourneau blade and an 8-vd LeTourneau Carryall; one Caterpillar D-8 tractor





ONLY SMALL EASILY-MOVED EQUIPMENT is used. The 3-yd dragline with 85-ft boom (left) is benching the deepest cover on the Morgan grant. Mining is nearly completed and the strippings surrounding this knoll have been restored. Contour of totally restored farm land often is better than before stripping, as is the case with this field at the right.

with LeTourneau blade and LeTourneau 16-yd Carryall; one Parmanco horizontal drill and three Homelite

2-in gas-driven pumps.

The other pit has the following machinery: one Marion 381 shovel, high-lift, 32-ft boom, 2-yd Marion dipper, Buda-gasoline-powered, used for both stripping and loading; one D-7 Caterpillar tractor with LeTourneau blade and 8-yd LeTourneau Carryall; and three Homelite 2-in pumps.

The few pumps in use and their small size is indicative of the locations being stripped — principally knolls where the seam is above drainage. The one Parmanco drill at the Morgan grant also handles the drill-

ing for the other pit.

The seam mined is the Pittsburgh No. 8 which, in the vicinity of Cadiz, is 54 in thick. Very little of the property was underground-mined and some that was was done so many years ago that there is no record or outward appearance to indicate the workings.

#### FERTILE TOPSOIL STORED FOR RETURN TO STRIPPED AREA

For stripping under a total-restoration grant, Mr. Fay prefers islands of coal under knolls with not over 35 ft of cover and including at least 18 in of top soil and subsoil. With deeper cover where the stripping ends at a highwall, only a limited area can be completely restored. An eroded farm with only a few inches of soil is not worth restoring.

In stripping a knoll to be totally restored, the 18 in or more of top soil and subsoil is picked up with a Carryall and stored, as a usual procedure, down the slope beyond the limits of the stripping. For that reason recov-

ery of 30 acres of coal from a knoll requires restoration of about 40 acres of ground, since it must include the area on which the top soil is stored.

After stripping is completed and the coal recovered, leveling is done, principally by bulldozers. After grading the lower spoil to the contour preferred by the farmer—which usually is an improvement over the original contour—the Carryalls return the 18 in of top soil and spread it evenly over the whole area, doing the final leveling by blading. The thorough mixing of the 18 in of top soil actually increases the fertility in many cases by including minerals that are not brought to the surface by normal plowing, which rarely exceeds a 9-in depth.

#### METHOD PREVENTS EROSION

Timing, for the proper season of the year, is a real problem in coordinating stripping and leveling. The latter can be carried out only during dry weather, which means 3 or 4 mo during the summer season, and must be finished in time to sprout a rootlock crop, such as winter wheat, to prevent erosion during the winter.

Therein lies a major difference from the reclamation required by state law. The law calls for planting grasses in the spring, and, as a rule, the ground, leveled in the summer or late fall and left without a root lock, erodes tremendously during the first winter. Ditches 5 to 8 ft deep often

appear by spring.

Furthermore, state reclamation does not require keeping the soil separate for replacement on top. That would be futile anyway on many marginal farming lands where only a few inches of good soil exist. Even though there may be several feet of

good top soil and subsoil, it is virtually lost when mixed with the entire overburden.

Mr. Fay advocated a severance tax per ton of coal instead of the present reclamation law passed in 1948. He believes that most of the reclamation done only because required by law is wasted money. The community gets little or no good from the expenditure, and it does not add a taxable value to the land. In comparison, the community could make many local improvements from the proceeds of a severance tax, he points out.

#### CROPS PRODUCED IMMEDIATELY

The county agent advises Mr. Fay on total restoration. Samples of the replaced and thoroughly mixed top soil and subsoil are analyzed and the necessary treatment prescribed. On the Morgan grant, limestone was present and the analysis showed that no liming was required. The winter wheat planted to anchor the soil against erosion may, if the season is favorable, produce a valuable crop of 20 to 35 bu per acre.

As a rule, some timothy is planted in the early fall with the winter wheat. After harvest of the wheat, clover may be planted and, with the timothy, produces a good pasture or a crop of hay the second season. After that, the ground has settled sufficiently so that the farming can be resumed following the usual crop-rotation methods.

The presence of limestone in the soil, as found on the Morgan grant, constitutes one of the natural conditions favorable to total restoration. Liming expense may be the factor that in some cases militates against recovery of coal where a farmer demands total restoration.





LOADING COAL with a 2-yd high-lift shovel, which also does much stripping. The bench was made by a 3-yd dragline.

C. C. Fay, Rail & Lake owner, stands beside the 2-yd dipper, which loads the 54-in seam without shooting.

# Mining Safety... A Program for Coal

Coal is being weighed in the safety balance. Its hope is demonstrating that safety is its first concern, that it has an effective program, and that it is willing and able to carry it out. Here are some suggestions for developing a better program and thereby speeding up safety progress.

#### The Safety Situation

HAS THE COAL-MINING INDUSTRY reached a safety turning point? Will the road from here lead more and more to really burdensome outside regulation and sharp limitation of industry self-determination in this field perhaps leading to limitation in other fields as well?

Entirely apart from the basic need for faster progress in safety, the public reaction to recent disasters puts these questions and their answers squarely before the industry. Unless coal can show that it has the will and the means to achieve the ultimate in protecting men from mining hazards, it could well find itself subject to increasingly sharp restraints on industry responsibility and self-determination. Bills to that effect are before Congress and are considered likely to pass in the absence of a convincing industry showing to the contrary. Even if one of the stricter versions did not pass now, another disaster could well bring about its adoption by convincing the public, in the absence of a definite, constructive industry program, that such a measure is necessary.

Does coal's record, admitting the errors of commission and omission that have been made, really warrant the conclusion that the industry should be relieved of all self-determination in this field? In the decade ending with 1951, the bituminous fatality rate has been cut almost in half—from 2.08 (1941) to 1.29 per million tons; the anthracite rate one-third from 3.39 to 2.41. Admitting that the rate of improvement should have been better, such progress still could not have been made without active mining cooperation.

Unhappily, in spite of the gains that have been made, the coal industry is judged by the public not on its overall record but rather on the headlines that follow disasters. Unhappily, also—and in spite of that progress—the industry is faced with a difficult problem in proving that it has fully developed the philosophy and mechanisms necessary for maximum progress, one reason being the lack of a visible, publicly functioning organization devoted to safety progress. Finally, there is considerable dissatisfaction within the industry not only with these matters but with the more-vital one of coal's own progress.

Thus, coal mining is confronted with at least two immediate and critical problems:

1. Proving before the bar of public opinion—whether in the form of a Congressional committee or otherwise—that the industry is ready, willing and able to discharge its safety obligations to the fullest. Coal should be ready now to show the Congress or anyone else that it has such a program and is taking positive steps to carry it out.

Strengthening the mental approach and developing to the limit the mechanisms necessary to achieve the really important goal—elimination of injuries and fatalities, whether from disasters or from any other cause, to the highest degree humanly possible.

Looking at these problems, a substantial group of operators feels that proper federal legislation would contribute to reaching these objectives. An equally substantial body is of the opposite opinion. But whatever the measures to be taken, all agree that they should be realistic and constructive, and that they should emphasize development of the all-important safety spirit.

#### What Coal Can Do

If it is accepted that self-determination in safety, as in all other things, is worth preserving, and, more important, that saving lives and preventing injuries is the overriding goal, then ways and means become the next order of business. Concrete action is the product of a number of steps, tangible and intangible, including both mental approach and organization. And concrete action depends on more than management alone. Employees have an even more direct and personal stake and consequently they—and their representatives—should be equally interested in developing an industry program that will yield the maximum in results.

What are some of the things that might be a part of an industry program? Analysis of the problem indicates the following, among others:

#### 1. ACCEPTING LEADERSHIP

The starting point in safety is wholehearted acceptance of the principle that the rewards of safety—in human values and in cash—are worth the effort. In other words, if the mental approach is right, half the battle is won.

Full acceptance of this basic principle leads logically to the conclusion that leadership in safety belongs in the industry—not in some outside organization. And this conclusion leads logically to another: the industry should be writing the safety codes and laws, and—equally or more important—should be seeing to their adoption and observance. There is good precedent for this in the stripping and mine-safety laws, or revisions thereof, in certain states, which were prepared and advocated by the industry.

Experience in both instances proves the value of this type of leadership. First, a climate is created in which it is easier to achieve results. Second, the results are achieved with a minimum of burden on the industry. Third, the industry appears before the public in the most-favorable light. Thus, public, industry and employee interests are served to the best-possible advantage.

#### 2. ORGANIZING FOR RESULTS

It detracts nothing from the credit due the offices now functioning in the industry to observe that one of coal's major difficulties in defending itself at the bar of public opinion is its lack of organization for safety as an industry. Numerous companies have made great strides in organizing for effective operation at individual mines, but there is no visible industry organization—so labeled—at which the public can look and conclude that the industry is doing its part. Even more important, it can be argued with some force that such an organization—broader and with more authority than now exists—would be a potent force for safety progress.

Exact details cannot be laid down in advance of coming to grips with the problems of organization, but some possible leads for exploration might be listed. For example, an industry safety organization—so named—might be set up in each producing region, with a national organization over all. Whatever its form, each association would have authority derived from the consent of its members, and its goal would be promoting safety by every possible means.

The association could develop codes of safe practices

and revise and modify them as necessary without delay, render consulting service to its members, keep an eye on safety conditions, and work with legislative bodies, safety officials and all others involved in the safety problem in improving standards, promoting enforcement and eradicating hazards and unsafe practices, in addition to doing its share to foster education and develop the necessary safety consciousness. This already is the general practice in certain regions and has achieved results.

#### 3. BRINGING IN THE MINER

One of the most glaring weaknesses in safety work in the coal industry is the largely passive role of the miner. Men who are sold on the value of safety and are eager to do their part can contribute immeasurably to any individual or industry program. Mine workers and their organization, therefore, should take an active and constructive part in safety, and the industry should make provision for such participation and for making it effective.

#### 4. SUPPORTING SAFETY AGENCIES

On the principle that the more hands the lighter the work, and to take advantage of services only independent agencies can render, the coal industry should include such agencies in its thinking. For example, coal should interest itself in the personnel and operation of state inspection and safety agencies to improve their effectiveness. That goes for other agencies also, and industry policy should include active backing for sufficient funds for personnel and facilities for a real job of research, education and training—this in addition to expenditures by the industry itself to render the achievement of these important goals doubly sure.

#### What Coal Can Gain

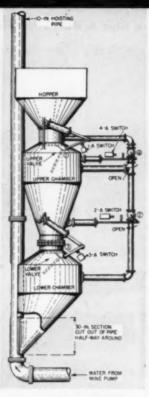
In the last analysis, the ultimate in safety is reached when every man—whether manager or worker—asks himself before he does anything, "Is this safe?" Laws are not a substitute for this basic attitude, which is really a way of life. There is, of course, need for a proper legislative foundation for safety. But it should be a foundation, not everything, since there is no magic in legislation nor in a special tag.

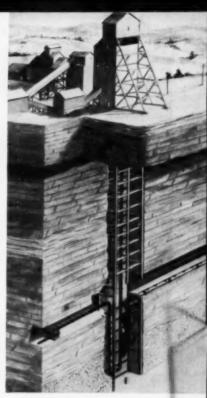
By taking a more-positive part—as an industry—to supplement individual and company action, coal can reap real advantages in at least three ways:

- It can speed up the process of attaining the ultimate in mine safety, thus contributing most effectively to achievement of the real goal.
- It can improve its mining efficiency, because the safe methods are the efficient methods.
- It can ward off attempts to enclose it in a rigid straitjacket on the ground that it cannot and will not meet its safety obligations.

Coal may not have too much time. The watchword should be action now.







Zinc mine hydraulically raising 240 tph of 4-in-plus ore 365 ft to the surface poses the question . . .

#### Why Not Hoist Coal by Pumping?

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Installed on a demonstration basis, the full-sized unit illustrated above is delivering ore crushed to 4 in underground a vertical distance of 365 ft to the surface through a standard 10in pipe placed in a shaft compartment. With five pumps delivering about 2,000 gpm from various underground sumps to feed the column, hoisting capacity is 120 tph with 2-ton charges. By increasing water flow to 2,500 gpm, capacity is boosted to 240 tph with a loading cycle of 30 sec or, by doubling chamber capacity, with a 1-min cycle. About half the ore is larger than 4 in, some being 8 or 9 in.

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Chambers now are loaded by hand in 1- or 2-ton batches. Future loading will be done by conveyor belt as shown in the drawing at the right. Total headroom for the loading chambers below the 330-ft level is 22 ft. An exterior view of the unit also is shown above (left).

Static pressure on the chambers with the water at rest is 155 psi. With water in motion, pressure is 160 psi and there is no appreciable change during hoisting of rock. The ammeter reading of 87 amp on one motor while water was in motion also showed no appreciable change when rock was hoisted. While operating data on the full-sized unit is not yet complete, experimentation with working models indicated no evidence of appreciable abrasion on the pipe. This was thought to be a result of the tendency of the ore particles to move through the high-velocity center part of the pipe.

At present, water from a dewaterizer on the surface goes to a settling pond, while the ore is stored in a temporary demonstration bin. Where water inside the mine is insufficient, a closed circuit from the surface can of course be maintained.

#### Tables and Heavy Media Are Hart & Hart's Formula for Quality Coal . . .



LARGE STORAGE AREA for raw coal ensures plant operation when mine is down and keeps trucks rolling when washing plant is down. Coal is buildozed into hopper as needed.



RAW COAL FROM HOPPER is screened to plus and minus 7 in. Oversize is hand-picked and crushed to 7 in. Reciprocating feeder provides even flow to elevating conveyor.



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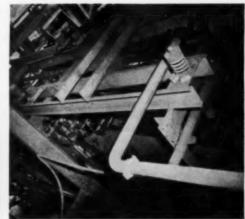
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#### Compact Plant-Quality Coal

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coal into end-dump trucks, which haul it to a broad plateau some 27 ft above the level of the preparation-plant floor. The trucks discharge into a 75-ton hopper or, on the plateau, whence the coal is dozed into the hopper.

Mine output is cleaned in a new plant built alongside an old tipple. The old structure now is used only for blending the washed products, oil-treating the coal with a Viking system and loading it into railroad cars. The "bugs" have been eliminated from the new plant and aluminum siding is in place. Under George L. and F. Maurice Hart, partners, a Lennox hot-air furnace and Iron Fireman Stoker have been added in the plant and a Lennox furnace in the old tipple.

From the storage hopper in the dumping area, run-of-mine coal is fed evenly onto a 4x10-ft Simplicity vibrating screen over a reciprocating feeder designed by Mr. Hart. The screen discharges minus 7-in raw coal to an elevating flight conveyor and shunts plus 7-in coal aside to a Pennsylvania crusher

for reduction to minus 7-in size. The crushed coal is fed back to the screen. Rock and slate are hand-picked from the plus 7-in coal en route to the crusher.

#### HOW TWO-CIRCUIT PLANT WORKS

The elevating conveyor discharges 180 tph of raw feed to a 6x14-ft Allis Chalmers double-deck Ripl-Flo vibrating screen equipped with water sprays for pre-wetting the coal. The 7x0-in coal off the top deck and the %x1-in coal from the lower deck, totaling about 150 tph, go into the heavy-media circuit. The minus %-in size, a little over 30 tph, goes to concentrating tables.

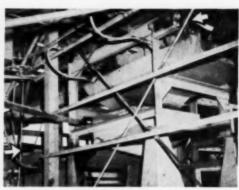
Three Deister SuperDuty Diagonal-Deck washing tables take up to 11 tph each of minus %-in raw coal from a rotary distributor beneath the double-deck screen, separate the coal and impurities and produce 25 to 28 tph of 0x3/8-in clean coal. A 4-in Wemco sand pump elevates the clean table coal from a storage vat below the tables to a 4x14-ft Allis Chalmers Low-Head dewatering screen near the top of the plant. The \%-in by 28mesh coal from this screen is conveyed to the old tipple to be mixed with heavy-media products. Clean coal from the three tables totals about 22 tph.

Refuse from the dewatering

#### Hart & Hart Cost Cutters-Low Magnetite Loss, Little Fresh Water . . .



SETTLING TANK receives pulp of magnetite and minus %-in from rinsing screen. Bar magnets on feed pipe polarize magnetite for fast coagulation and settling.



TWO MAGNETIC DRUMS in series recover over 99% of magnetite from settling-tank underflow. Fine coal is pumped to concentrating-table circuit; magnetite to densifier.



DENSIFIER WITH SCREW can be adjusted to feed magnetite back into circuit as desired, thus accurately controlling specific gravity of heavy media.



ELECTRO-MAGNETIC COIL, powered by m-g set (left), demagnetizes magnetite re-entering plant circuit from densifier. Specific gravity of media is checked every 15 mln.

screen is minus 28-mesh materials. which drain from the screen with the water and flow by gravity to a concrete floor sump. Table refuse is pumped by a 2-in Wemco sand pump to a 3x6-ft Aero-Vibe screen for dewatering. About 5 tph of 38inx28-mesh solids passing over the screen is conveyed to the 93-ft refuse belt for storage in an elevated steel bin, 50-ton capacity, whence it is hauled away by truck. Minus 28-mesh screenings from the Aero-Vibe screen pass with the water by gravity into the concrete floor sump. Minus 28-mesh refuse is pumped through a 6-in Wemco sand pump to the slime pond.

#### CLEANING BY HEAVY MEDIA

Heavy media cleans about 150 tph of 3/8x7-in raw feed from the two decks of the 6x14 Ripl-Flo vibrating screen at the top of the plant. Raw coal passes from the

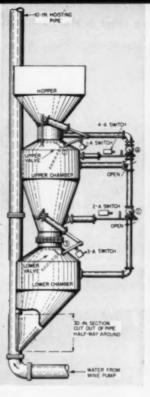
screen into a short sluice, where the cleaning media—water and magnetite—are added. The sluice discharges into an 8x6-ft Wemco revolving drum separator at a point some 15 to 20 in below the level of the medium inside the drum. More media are added inside the drum. Clean coal rises quickly to the surface inside the drum and pours out through the circular mouth along with the overflowing media.

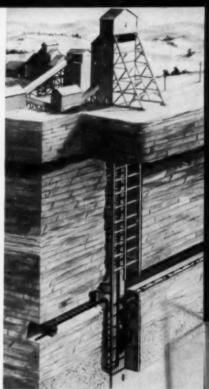
Refuse sinks rapidly to the bottom of the drum. As the drum turns, inside vanes on the cylindrical shell sweep the refuse upward in an arcing path and dump it into an upper discharge sluice passing out through the mouth of the drum.

Coal and refuse are discharged from the drum onto a 5x12-ft Allis Chalmers single-deck Low-Head screen for drainage of the media. Separation between clean coal and refuse is maintained by a vertical steel partition that extends the length of the screen. Water and magnetite drain into a storage vat and are recirculated to the drum through a 6-in Wemco sand pump.

Coal and refuse, still separated by the vertical partition, pass on to a 5x12-ft Allis Chalmers doubledeck Low-Head screen. There, the magnetite clinging to the coal and refuse is rinsed off by water sprays and drained into a second storage vat. The 3/8x3- and 3x7-in cleaned coal from the two decks, totaling about 130 tph, together with the 3/8-in x 28-mesh clean coal from the concentrating tables, is discharged onto an 85-ft three-compartment flight conveyor and carried to the old tipple, where it is re-screened, blended, mixed and oil-treated, and loaded over booms and chutes into railroad cars.







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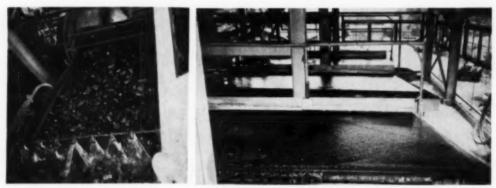
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for reduction to minus 7-in size. The crushed coal is fed back to the screen. Rock and slate are hand-picked from the plus 7-in coal en route to the crusher.

#### HOW TWO-CIRCUIT PLANT WORKS

The elevating conveyor discharges 180 tph of raw feed to a 6x14-ft Allis Chalmers double-deck Ripl-Flo vibrating screen equipped with water sprays for pre-wetting the coal. The 7x0-in coal off the top deck and the 3x1-in coal from the lower deck, totaling about 150 tph, go into the heavy-media circuit. The minus 3x-in size, a little over 30 tph, goes to concentrating tables.

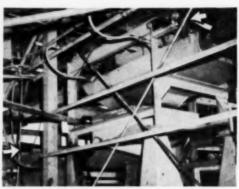
Three Deister SuperDuty Diagonal-Deck washing tables take up to 11 tph each of minus %-in raw coal from a rotary distributor beneath the double-deck screen, separate the coal and impurities and produce 25 to 28 tph of 0x3%-in clean coal. A 4-in Wemco sand pump elevates the clean table coal from a storage vat below the tables to a 4x14-ft Allis Chalmers Low-Head dewatering screen near the top of the plant. The %-in by 28mesh coal from this screen is conveyed to the old tipple to be mixed with heavy-media products. Clean coal from the three tables totals about 22 tph.

Refuse from the dewatering

#### Hart & Hart Cost Cutters-Low Magnetite Loss, Little Fresh Water . . .



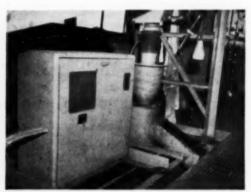
SETTLING TANK receives pulp of magnetite and minus %-in from rinsing screen. Bar magnets on feed pipe polarize magnetite for fast coagulation and settling.



TWO MAGNETIC DRUMS in series recover over 99% of magnetite from settling-tank underflow. Fine coal is pumped to concentrating-table circuit; magnetite to densifier.



DENSIFIER WITH SCREW can be adjusted to feed magnetite back into circuit as desired, thus accurately controlling specific gravity of heavy media.



ELECTRO-MAGNETIC COIL, powered by m-g set (left), demagnetizes magnetite re-entering plant circuit from densifier. Specific gravity of media is checked every 15 min.

screen is minus 28-mesh materials. which drain from the screen with the water and flow by gravity to a concrete floor sump. Table refuse is pumped by a 2-in Wemco sand pump to a 3x6-ft Aero-Vibe screen for dewatering. About 5 tph of 3/8inx28-mesh solids passing over the screen is conveyed to the 93-ft refuse belt for storage in an elevated steel bin, 50-ton capacity, whence it is hauled away by truck. Minus 28-mesh screenings from the Aero-Vibe screen pass with the water by gravity into the concrete floor sump. Minus 28-mesh refuse is pumped through a 6-in Wemco sand pump to the slime pond.

#### CLEANING BY HEAVY MEDIA

Heavy media cleans about 150 tph of 36x7-in raw feed from the two decks of the 6x14 Ripl-Flo vibrating screen at the top of the plant. Raw coal passes from the

screen into a short sluice, where the cleaning media—water and magnetite—are added. The sluice discharges into an 8x6-ft Wemco revolving drum separator at a point some 15 to 20 in below the level of the medium inside the drum. More media are added inside the drum. Clean coal rises quickly to the surface inside the drum and pours out through the circular mouth along with the overflowing media.

Refuse sinks rapidly to the bottom of the drum. As the drum turns, inside vanes on the cylindrical shell sweep the refuse upward in an arcing path and dump it into an upper discharge sluice passing out through the mouth of the drum.

Coal and refuse are discharged from the drum onto a 5x12-ft Allis Chalmers single-deck Low-Head screen for drainage of the media. Separation between clean coal and refuse is maintained by a vertical steel partition that extends the length of the screen. Water and magnetite drain into a storage vat and are recirculated to the drum through a 6-in Wemco sand pump.

Coal and refuse, still separated by the vertical partition, pass on to a 5x12-ft Allis Chalmers doubledeck Low-Head screen. There, the magnetite clinging to the coal and refuse is rinsed off by water sprays and drained into a second storage vat. The 3/8x3- and 3x7-in cleaned coal from the two decks, totaling about 130 tph, together with the 3/8-in x 28-mesh clean coal from the concentrating tables, is discharged onto an 85-ft three-compartment flight conveyor and carried to the old tipple, where it is re-screened, blended, mixed and oil-treated, and loaded over booms and chutes into railroad cars.



SETTLING POND (foreground) covers several acres. With adjustable weir, overflow can be kept clear. Pond provides about 675 gpm of total 750 gpm needed.



MART & HART SPARKPLUGS: Mr. Mitchell (left), plant maintenance; G. L. Hart, partner; and Mr. Burgess, plant foreman. F. M. Hart, partner is not shown.

The %x6-in refuse from the rinsing screen in the heavy-media circuit is discharged through a chute onto a conveyor belt and elevated to the refuse storage bin.

#### **HOW TO SAVE MAGNETITE**

Every care is taken to conserve magnetite. Water and magnetite draining from the drainage screen is recirculated to the revolving separator drum. Media rinsed off the coal and refuse on the rinsing screen flows into a second storage vat, whence it flows by gravity to a thickening tank 14 ft in diameter and 3 ft deep. En route to the thickener, it passes between a pair of 12-in permanent magnets. These magnets impart polarity to the magnetite particles so that they coagulate quickly and sink rapidly to the bottom of the tank, together with fine particles of coal.

Overflow from the settling tank flows by gravity to the concrete floor sump. Underflow, containing magnetite, coal and impurities, is pumped through a 1½-in Wemco sand pump to two Magnetic Engineering & Mfg. Co. magnetic-separator drums arranged in series and equipped with water sprays. Over 99% of the magnetite washed off the coal at the rinsing screen is recovered by the drums—about 96% in the primary drum and 96% of the remaining 4% in the secondary drum.

Non-magnetic particles from the magnetic drums—degradated coal and impurities—are pumped to the Deister tables for cleaning. The recovered magnetite is lifted through a 1½-in sand pump to a Wemco screw densifier 18 ft 10 in long and 36 in deep and wide. There the magnetite is stored for

re-use. The screw, the inclination of which can be adjusted by means of a small electric motor, feeds the magnetite into the circuit, as needed, through a 6-in demagnetizing coil, which causes the particles to repel each other and thus disperse themselves through the medium. Direct current for this coil, as well as for the magnetic-separator drums, is provided by a small Reliance m-g set located alongside the coil.

The demagnetized magnetite from the densifier re-enters the coal-cleaning circuit through the storage vat beneath the drainage screen, whence it is pumped into the revolving drum separator. Overflow from the densifier is recirculated through the permanent magnetic blocks and into the settling tank.

The closed heavy-medium circuit with efficient recovery of magnetite makes it unnecessary to add much magnetite. Mr. Hart reports that throughout July, while the plant loaded 7,344 tons of clean coal, only 600 lb of magnetite was added. Magnetite is purchased in 100-lb bags at 2¢ per pound from Foote Mineral Co., Philadelphia.

As mined, the No. 11 seam is rather high in ash and sulphur. However, specific-gravity checks, made every 15 min by a gravimeter, maintain media density at 140 to 142, which has been found optimum for cleaning of this coal. At that density, refuse averages about 20% of raw feed. To meet different specifications or to correct drifts away from required density, specific gravity can be changed within 10 to 15 min. Cleaned product at the Hart & Hart Precision-Washed mine aver-

ages 6 to 7% ash and less than 3% sulphur.

#### **ECONOMIZING ON WATER**

Water circuits in the plant are designed for maximum recirculation and minimum fresh-water feed. Used water, containing impurities and minus 28-mesh coal, is pumped from the concrete floor sump in the plant through a 6-in sand pump to a settling pond about 1/4 mi from the plant. Clear water overflowing an adjustable weir in the settling pond passes to a storage pond, whence it is circulated to the plant. A fresh-water lake close by is drawn on to make up plant losses. Out of total water requirements of 750 gpm, only 76 gpm is pumped in from the freshwater lake.

Total connected load of the cleaning plant, exclusive of the old tipple, is 346 hp. Power reaches the plant over a 3,300-v highline and is stepped down to 220 v for plant operation through three 100-kva transformers. A central console and a bank of enclosed switchgear provide controls for the plant.

The washing plant and tipple require the services of nine men—two men in the washing plant, a weighman, a scaleman, a handpicker, two car-droppers, a boom operator and a greaseman. W. T. Burgess is plant foreman and Herman Mitchell is maintenance man. R. L. Whitlock is pit foreman at the stripping operations. Mr. George L. Hart triples in brass as partner in the firm, general manager and superintendent.

Meador, Young & Holt Coal Co., Clay, Ky., and other sales associates are sales agents for Hart & Hart.

#### More Speed for Coal Research

Coal needs more research to build up markets. BUT you can't do research without money-big money. SO a group of top coal men offer a Plan of Action.

APPROVAL OF A PLAN OF AC-TION aimed at widening coal's market through research, development and promotion will be asked of producers, shippers and allied interest when Bituminous Coal Research, Inc., holds its annual meeting Feb. 28 at the Edgewater Beach Hotel, Chicago.

The plan proposes a balanced and greatly enlarged research program, promotion of research results from the laboratory stage through to commercial production, wider services to coal customers and establishment of a Bituminous Coal Research Center.

An income to BCR totaling \$3 to \$4 millions per year is envisioned. Coal and other interests, including some coal companies and certain other industries that have not contributed to BCR in past years, already have agreed to the proposed assessment increases on over 100,000,000 tons. The go-ahead mark is 150,000,000 tons. BCR directors have endorsed the program and approved its presentation at the meeting in Chicago.

The new proposal for BCR was shaped by a 37-man committee that undertook a year-long study following the 1951 annual meeting at Columbus, Ohio. The committee includes representatives of coal producers and shippers, railroads, steel and electric utilities.

The committee's findings, to be reported at the Chicago meeting, are as follows:

 The present research program is inadequate in size and scope to meet the technical needs of the industry.

The needs of the industry and its customers can best be served by research that is carried beyond the laboratory stage to commercialization.

3. Research results must be promoted if coal sales are to be increased.

A research center owned, operated and staffed by the industry is essential to the technical advance of the industry.

 Broader and more adequate financial support is needed from coal and related industries to carry out the activities that will ensure broader markets.

 Every research project must be appraised for economic as well as technical soundness. This points up the need for market as well as technical surveys. Research must be concentrated on those projects that offer coal a good competitive chance alongside other fuels.

7. Industrial research takes patience as well as talent and money. Ideas must be created, developed and sold. General industrial experience shows that a project of moderate size and difficulty, if adequately financed, properly staffed and aggressively promoted, can be processed to the commercial stage in about 5 yr. Another 3 to 5 yr may elapse before the breakeven point is reached.

Ît takes money to sell research.
 To ensure an adequate return on research investments, research results must be sold and put to work.

The proposed Bituminous Coal Research Center would consolidate the enlarged BCR program. Concentration of work at this center would be more efficient than the present system of farming out projects to independent institutions, the committee believes. It also would produce practical results faster and bring a greater return per dollar invested.

The research center, besides providing a pool of trained technical men for the industry, also would provide member companies and their customers with answers to specific technical problems. In addition, it would be a symbol to the public at large of the industry's progressive advance.

#### Research Costs Money-But It Pays Off

#### How BCR's Plan of Action Would

	Assessment (Cents)
Coal producers, per ton shipped or sold	1.00
Coal-sales agencies, per ton shipped or sold	1.00
Captive producers, per ton produced	0.30
Coal-land companies, per ton of leased produc	ction 0.04
Railroads, per dollar bituminous coal-traffic revenue	0.05
Equipment manufacturers, per dollar sales to bituminous industry	0.05

Total expected revenues per year \$3-\$4,000,000

#### What Others Spend for Research

	Per Year
INDUSTRIES	
Automotive	\$100,000,000*
Air conditioning and refrigeration	10,000,000
Petroleum	125,000,000
COMPANIES AND ASSOCIATIONS	
Standard Oil Development Co.	22,000,000*
Standard Oil Co. (Ind.)	9,400,000
Shell Oil Co.	18,500,000
Westinghouse Electric Corp.	50,000,0001
E. I. du Pont de Nemours	38,000,000*
American Cyanamid Co	10,000,000
Electro-Motive Div., General Motors Corp.	6,000,000†
American Gas Association	1,100,000

#### What BCR's Proposed Plan of Action Will Do

An income of \$3-\$4 millions per year will provide BCR with funds and staff adequate for all phases of research, development, engineering and promotion. That sum also will enable BCR to make technical and market surveys for guidance in selecting projects, carry on exploratory research and make studies of trends in other industries affecting coal's future markets.

Specifically, here are some examples of the types of projects envisioned by the BCR Plan-of-Action Committee:

#### RESEARCH, DEVELOPMENT AND TEST

 Develop promising new ideas from staff, technical committees and outsiders, especially those ideas that aim at mass markets, lower production costs and greater satisfaction to users.

Examine, test and evaluate equipment submitted by manufacturers and inventors and, in some instances, provide financial and promotional help for the commercial development of worthwhile items.

Develop new coal-burning equipment for the farm.
 Spend at least 10% of available funds for basic long-term research on coal and coal utilization, seeking facts

and principles that will guide research and development of new processes and new types of equipment.

#### INFORMATION

1. Keep fully informed on research in coal and competing fuels in this country and in other lands.

#### COOPERATION

 Work with manufacturers of coal-burning and coalhandling equipment, industrial and domestic, in developing new equipment for homes, commercial users and small power plants to give coal customers more satisfaction and win new friends for coal.

2. Cooperate with manufacturers of equipment for coal's

big customers-present and potential.

 Conduct investigations with railroads, electric utilities, steel, chemical and other industries to find new and better ways to use coal.

4. Work with other agencies in enlarged research and development of equipment and methods to prevent air pollution and reduce combustion gases and dust, thus winning wider public acceptance for coal.

Cooperate with other groups in development of mining and preparation methods that will cut costs and improve quality, thus strengthening coal's competitive

position.

 With other agencies, seek ways to give coal users maximum satisfaction.

#### PROMOTION

 Assist aggressively in increasing coal's markets through preparing and distributing bulletins, technical promotional aids, reprints and technical reports, and through carrying on surveys, tests and plant demonstra-

To support their plan for enlarged research, committee members cited the contributions of BCR thus far. They expressed the belief that if so much could be done with only \$500,000 per year—the average sum available since 1943—the greater income proposed would bring still richer rewards. Major advances the committee cited are:

Industrial—Ways and means of controlling smoke and flyash emission from industrial stacks were ready when public pressure increased for clean air. The result is that BCR now is looked to as a basic source of information and help on industrial smoke-abatement and air-purification problems.

Equipment and methods for reducing dust and flyash from spreader stokers have been developed, bringing credit to the industry among its customers and the general public.

Methods for mechanical coal and ash handling have been studied and circulated among operators and owners of small plants, with consequent improvement in coal's competitive position in this field. Automatic stokerboiler units now are under BCR development for this same field.

Use of electric furnaces, with power made from coal, now is under study by BCR and steel and utilities experts.

Residential - Smokeless - burning principles have been developed and applied to residential heaters, furnaces, stoves and boilers.

Production models of the BCR smokeless warm-air furnace have been built and put under field test, where they are performing well. Also, a trial model of a bin-fed ash-removal stoker has been built and now is being tested. Work on a smokeless boiler has been postponed until more funds are available.

Eighteen plans for houses using coal have been designed and widely distributed among builders, contractors, architects and homeowners. The economics of group residential heating also has been established and the data have been published.

Agricultural—Bituminous has been widely promoted for farm uses, including tobacco curing, heating and drying of farm products. More research still is needed to adapt burning equipment to special farm needs.

Gasification—Because of advances made by BCR and affiliated institutions, producer gas is becoming a competitive fuel. BCR is pursuing these studies but needs more funds to speed development. BCR also has supported basic research in gasification, carbonization, hydrogenation and chemicals production at Carnegie Institute of Technology.

Motive Power-Apart from the work of the Locomotive Development Committee, which is separately financed and administered, BCR has been active in upgrading the performance of coal-burning steam locomotives, largely through overfire air jets.

In the marine field, BCR has worked with other agencies to reduce smoke from coal-burning Lake steamers.

Mining and Preparation—Information has been developed on dustproofing and freezeproofing coal, thermal drying, formation of acid mine water and other problems. This is in addition to work by the Mining Development Committee, which is separately financed and administered.

Customer Relations - Close and friendly relations between coal users and coal producers have been established by service and information.

More than 80,000 reprints of BCR technical papers and more than 275,000 copies of BCR publications have been distributed. Also, well over 1,000,000 industrial magazines and trade journals have published information about BCR and its work.

A new series of publications entitled "BCR Aids to Industry" has been inaugurated to help coal users get the most from their fuel and to help coal producers expand their markets. These publications combine the latest research gains with the proved experience of coal producers, users, equipment manufacturers and cooperating laboratories.



LOWER GROUND PRESSURES, greater maneuverability, greater carrying capacity, faster unloading, simplified drive and better roadway conditions were major objectives in the development of the tracklaving shuttle car.

#### The Tracklaying Shuttle Car

#### WHAT THE CAR OFFERS

Goals in the design, construction and field testing of the tracklaying shuttle car were:

- 1. Greater Corrying Capacity—In the conventional shuttle car, clearance must be provided in the body for the turning of the wheels. This limits the width of the conveyor. Clearance pockets for the tires also cut down coal capacity. For the same overall width, a much wider conveyor can be built into the body of a tracklaying shuttle car. This further increases capacity by permitting more coal to be carried in the front, or discharge, end of the car.
- 2. Greater Maneuverability—Steering with the tracklaying shuttle car is similar to steering with the ordinary crawler tractor. One track is braked for turning. By varying the braking of the track, turns of varying radii may be made. For a sharp turn, one track may be locked and the car pivoted on it.

Flexibility behind a loading machine was a major goal. By locking the track, the loading end of the car may be moved from side to side with very little forward or reverse motion of the car. This is particularly useful in following the swinging boom of a loading machine.

- 3. Faster Unloading—For a fixed conveyor speed, the speed of unloading a shuttle car is directly proportional to the width of the conveyor. Thus, the wide conveyor of the tracklaying car shortens the time required for unloading.
- 4. Simplified Drive—There is a traction motor on each side of the car. Each motor is connected to a track through a gear box and roller chain. All the gears, drive shafts and steering mechanisms required for a conventional four-wheel-drive and steer shuttle car are eliminated.
- 5. Smoother Roadway—The large ground-contact area obtained from the use of a crawler-type track reduces ground-loading pressures to 12 to 15 psi. Each track carriage is spring-mounted on one end, producing a three-point suspension. These factors reduce breaking down of the roadbed and eliminate potholes resulting from traveling over the same routes. Another goal in reducing ground pressures was better flotation for help in operating on wet or soft bottoms.

Initial field experience indicates that a tracklaying shuttle car, with its ease and simplicity of controls and characteristics fitting it to a variety of mining operations, is a highly practical vehicle.

#### How the car is designed for coal-mine service

By R. N. CROSS

Locomotive and Car Development Dept., General Electric Co., Erie, Pa.

A SHUTTLE CAR, by the nature of its application, is inherently a low-speed vehicle designed to operate with a loaded weight of 15 to 25 tons as a general rule. Until recently, such cars have been equipped with rubber-tired wheels. However, the crawler-type shuttle car appears to offer a number of advantages. Its weight, for example, is distributed over a larger ground area, thus reducing ground pressure. In addition, the operating speed of 3 to 5 mph lends itself to the use of crawler tracks.

With the preceding as the basic consideration, a pilot car was built to obtain data on performance under actual operating conditions. After factory testing, the car was placed in a mine, where it is now in service.

In designing the tracklaying shuttle car to meet mining conditions, key features were worked out as follows:

Track and Drive—Each track is separately driven by a 20-hp serieswound traction motor through a gear reduction followed by a chain and sprocket. Each motor is fitted with an hydraulic steering brake. The track carriage is hinged to the body at the track-drive end. At the front, or idler, end the carriage is flexibly connected to the body by a torsion spring. The front main idler is positioned by two track-recoil springs to absorb shock and maintain proper track tension.

The track-link assembly is made up of forged and hardened steel side links with hardened steel pins and bushings. Each track runs on seven main rollers, and is supported over the top of the track carriage by two idler rollers.

Hydraulic System—The cable reel, steering brakes and lift cylinders for the elevating discharge are hydraulically operated. An accumulator in the hydraulic circuit speeds up the elevating of the conveyor-discharge end, and also provides a reserve of hydraulic pressure if the power fails.

Conveyor—The conveyor is electrically driven by two 5-hp series motors. These motors may be operated in either series or parallel to obtain slow or fast conveyor speed.

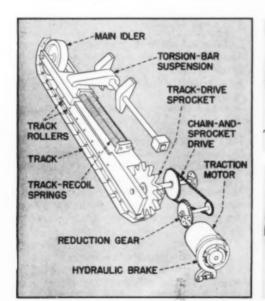
Control-All electrical equipment is

of sealed construction. The main controller case containing the contactors and relays, and the conveyor controller, are blown for adequate ventilation. Contactors are of the standard magnetic type.

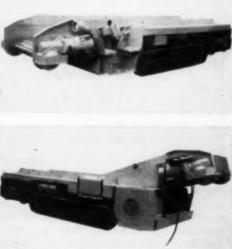
There are three acceleration steps on the traction motors. The first two are resistance steps, and the third connects the motors across the line. Overload relays protect the traction motors. Light and control circuits are fused.

Steering of the shuttle car is simito that of a bulldozer with hard work and fatigue eliminated. There are two steering levers at the operator's position, or one for each track. These levers are connected to the tractionmotor power circuits and also to hydraulic brake valves.

When the steering lever is moved forward a few degrees, its corresponding traction motor is disconnected from the line. The car will then make a slight turn. Moving the steering lever still more applies hydraulic pressure to the steering brake. The position to which the lever is moved regulates the brake pressure. By varying the steering brake pressure, any desired radius turn can be made. For a very sharp turn, one track may be locked.



PHANTOM VIEW of shuttle-car track and drive. Each track is driven by a 20-hp motor with steering brake.



CONTROL AND CABLE sides of the 6-ton 250-v tracklaying shuttle car with elevating discharge.

# HOW TO HELP BRITAIN ...and Ourselves

The purpose of this editorial is to help Winston Churchill obtain the aid Britain needs

- to weather her present financial crisis, and
- (2) to avoid a chronic recurrence of such crises.

This is not a philanthropic purpose.

Britain is our staunchest ally in the free world's continuing fight for survival. She cannot perform her role effectively if she is broke, or if she careens from one financial crisis to another.

Then, too, a nation such as ours—committed to private enterprise as a way of economic life—has a special interest in helping Winston Churchill to help Britain. His administration is relatively friendly toward private enterprise. Should he fail, he would be replaced promptly by a Socialist government more hostile than ever. And that would weaken the standing of private enterprise in the free world.

#### Cause of the Crisis

It is the drive of the Western World under our leadership to rearm against Russian aggression that has precipitated Britain's financial crisis. It set off a scramble for raw materials from which armaments could be made, and for many other materials that might be short in the event of war. So the prices of the things that Britain must import—mostly raw materials—have been boosted more than the prices of things she can export—mostly finished products. That leaves Britain short of funds to pay for essential imports. This difficulty increases as the necessity becomes more urgent to divert industrial effort from production for export to production for security.

#### The Basic Trouble

Although Britain's immediate crisis was touched off by the rearmament drive of the Western World, her basic affliction is one from which she has suffered since the end of World War II. Stated in its simplest terms, Britain does not produce enough goods to pay her own way as one of the family of free nations.

For years this deficiency in home production was made up by income from shipping and overseas investment. But Britain had to sell a large part of her foreign investments to finance her heroic part in World War II. So her income from that source has been greatly reduced. And, in spite of an increase of about a third above prewar in her own production of goods and—thanks to a continued "austerity" program—a much larger increase in her exports, Britain still is not paying her own way.

#### **Two Ways to Solvency**

Britain has two ways to restore her solvency. One is to cut down on what is consumed—the belt-tightening process. The other is to step up British production.

To surmount the present crisis, Mr. Churchill has asked for some cutting down. He probably must ask for more.

Except as a stop-gap expedient, however, more cutting down of Britain's consumption is clearly a dangerous course. That would further depress a British standard of living which, not more than half as high as ours, already is too low. Politically such a course would grease the skids for Winston Churchill's administration, even now governing by a wafer-thin parliamentary margin. Also, as The (London) Economist remarks, the "lazy expedient of cutting trade" would result in "hurting other people and forcing them to take similar action"—by cutting the market for their products.

#### The Only Cure

The best and, in fact, the only way to help cure Britain's economic ills is to help Britain produce more. Here the technical possibilities are encouraging. On the average, the British industrial worker produces only about 40 percent as much a year as the American worker. That is a British estimate, made by Sir Ewart Smith.

Wider use of better industrial methods and modern tools and an infusion of the competitive incentive into British industry — to replace the cartel and other restrictive practices — would go a long way to narrow this wide gap in worker productivity. This is the consensus of experts on both sides of the Atlantic.

Since 1948 the Anglo-American Council on Productivity has done much to encourage output per man-hour in Britain and to foster this doctrine with both labor and management. But much yet remains to be done.

In the United States it is increasingly sug-

gested that before we give Britain any more economic aid we should insist that everything possible be done to exploit the technical possibilities of increased production. This emphasis on production is needed. But if we Americans were to impose upon the hard-pressed British people conditions that could be construed as an affront to a friendly and sovereign nation, we might well put into the hands of a masterful rabble-rouser such as Aneurin Bevan, the anti-American leader of the Labor Party's left wing, a campaign issue on which to maneuver himself into the Prime Ministership.

#### Churchill Can Insist

But Winston Churchill is not so handicapped as we should be in imposing prerequisites of further aid. As Britain's own, most honored leader he will raise no touchy questions as to Anglo-American relations if he insists that Britain have firm plans to cure her economic ills, plans sharply focussed on ways and means of increasing Britain's industrial efficiency.

By presenting a convincing plan to cure Britain's recurring crises through greater production, Mr. Churchill will greatly facilitate the process of getting the aid his country must have. He will also remove an increasingly dangerous element of dissension in Anglo-American relations—the feeling of many Americans that more aid to Britain is more money down the drain. The way to counter that feeling is to come up with a prescription for an economic cure, not a request for another economic poultice.

Technically, such a program is entirely feasible. It will perhaps be the supreme test of Winston Churchill's statesmanship to make it politically feasible as well.

In the interest of Britain, of the United States and of the whole free world, we wish him all success.

McGraw-Hill Publishing Company, Inc.

#### Energy-Key to Wealth

Two experts write a book about energy use, past, present and future. Their crystal ball shows coal's future stronger as oil and gas fail.

Atomic energy no early threat . . . Solar energy use destined to grow.

#### WOULD YOU LIKE TO KNOW:

How much fuel man has used since the earth was formed?

How to trap and use the sun's warmth?

Whether lightning can be harnessed for power?

How the Chinese used coal and natural gas 1,000 yr ago?

Why it was punishable by death to burn coal in England in 1306?

When the peak will come in oil production? Natural gas? Coal?

How and when atomic energy will compete with coal? You'll find the answers to these questions, and many others, in a brand new book. The book is Energy Sources: The Wealth of the World. The authors are Eugene Ayres, technical assistant to the executive vice president, Culf Research & Development Co., and Charles A. Scarlott, editor of Westinghouse Engineer.

The authors start out with a cosmic view—the role of energy in speeding man's cultural growth. They name and discuss the places where you find energy—in the sun above; on the earth's surface in rivers, wind and tide, plant growth and lightning; and in the earth's crust in fossil fuels, volcanic springs and radio-active minerals. The focus soon narrows. You look at these energy sources one by one. You find out how much there is of each and how long, as far as men now know, each will last

Naturally, you learn most about coal, oil and natural gas. But you speculate about synthetic liquid fuels, oil shale, atomic energy, solar warmth, heat pumps, steam wells and, as a source of energy, the oceans.

The authors lead you through the complex web of energy uses, conversions, waste, transport and competition. They show you what they see in their crystal ball—energy-production and energy-use patterns a quarter of a century and 100 yr from now.

They wind up with an energy balance sheet that shows how much energy is being produced, how much is changed to other forms, who uses it and how much is wasted in conversions, transportation and consumption.

The book makes sense because its arguments are supported by facts. It makes good reading because it's informative, simply written and touched here and there with wry humor.

Energy Sources contains 344 pages. It's published by McGraw-Hill Book Co., 330 West 42nd St., New York 36, N.Y. Price is \$5.

#### Facts and Forecasts From "Energy Sources" -

"The peak of oil production in the United States will come between 1950 and 1967 or, more plausibly, between 1955 and 1960. . . . The peak for all coal may be reached by the middle of the next century or almost certainly not later than the middle of the century after that. . . Natural gas is expected to maintain its steep climb up to 1960, while coal demand increases only moderately. The next decade, to 1970, is likely to show an entirely different story, for gas may then begin to decline."

"One can hardly escape the conclusion that, even when engineering problems are solved—and for all their magnitude, they most surely will be—power from uranium-fueled plants will not be cheap power. It is almost idle to speculate at this point. The problems are not likely to be solved quickly enough to permit a nuclear-power plant to go into operation before 1960, perhaps 1970."

"History written a few centuries hence may describe the United States as a nation of such extraordinary technologic virility that we succeeded in finding ways of dissipating our natural wealth more rapidly than any other nation. At any rate, we are having a wonderful time doing it."

"Of all the fossil fuel recovered since the

earth was created two billion years ago, more than 86% has been produced and used since 1900. . . . All of the fossil fuel produced in the world up to 1900 would satisfy the present world economy only about 5 vr."

"It is technically possible today to design a home (for a favorable solar climate) without chimneys or the odors or soot of combustion, to keep comfortably warm in winter with only one-twelfth of the customary consumption of energy."

"If all the lightning strokes going on all around the world could be coordinated to make a uniform flow of electric energy, we would have only about 30,000,000 kw-hr . . . one-hundredth enough to supply a single big city such as Pittsburgh."

"As far as we know, coal was mined and used . . . by the patient Chinese [about] 1,100 B.C. . . . They used coal and natural gas for space heating, for lighting and for the manufacture of articles of commerce. The gas was transmitted for considerable distances in bamboo pipelines."

"In 1306 King Edward made it a capital offense to burn coal because it had been found that the gases are poisonous. At least one man was executed for burning coal."

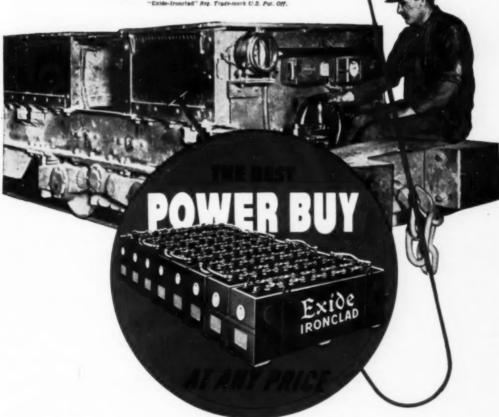
#### Exide-Ironclad BATTERIES ARE YOUR BEST POWER BUY-AT ANY PRICE

They PROVIDE ample power for fast, high-production haulage-more trips per shift, dependable round-the-clock performance, with no end-of-shift slowdown, no unscheduled down time . . . ASSURE inherent safety, with freedom from hazards of fire, fumes, noise... SHOW low costs of operation, maintenance, repair, depreciation. SIZES for all makes of battery-powered mine locomotives, trammers, shuttle cars. Call in an Exide Representative and let him prove these facts.

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### Foremen's Forum



#### The Captain Does His Duty

How a sea-going supervisor handled an emergency—a lesson in leadership

WITHIN THE PAST MONTH an epic of heroism and conscientious devotion to duty was written into the record for all the world to read by Captain Henrik Carlsen, skipper of

the Flying Enterprise.

Briefly, here is the story. Late in December, the Flying Enterprise, a 6,711-ton merchant ship, was caught in the worst North Atlantic storms within the last 50 yr. Time after time she was slammed with the Thor-hammer blows that only an angry sea can deliver. Finally, she split and went

Captain Carlsen's first concern was for the welfare of his crew and passengers, and as soon as other vessels appeared on the scene he ordered his charges over the side to safety. He alone remained aboard a ship that listed as much as 65 deg to port. The screw and rudder were out of the sea and one hold had filled with water. As if this were not enough, the Flying Enterprise was constantly buffeted by pounding seas and screaming winds. Thus began Captain Carlsen's lonesome, week-long defiance of the elements aboard his stricken ship.

What were the skipper's reasons for staying with his ship? After all,

#### Foremen's Quiz: No. 10 . . .

#### How are you on EVALUATING YOURSELF?

YOU HAVE TAKEN nine previous Foremen's Quizzes on a variety of subjects, such as promoting efficiency, cutting costs, getting jobs done, handling mistakes, promoting safety and exercising ingenuity. This one challenges you to think about yourself,

Look in the mirror by answering "Yes" or "No" to each of the 10 questions below. Then turn to p. 116 for a discussion.

- 1. Are you sure you want to be a supervisor? . . . . Yes □ 2. Are you self-conscious when giving orders? . . . Yes □ 3. Do you ever "close your eyes" to sloppy work or
- unsafe practices merely to avoid friction? . . . . Yes 4. Do you support your immediate supervisor? ... Yes
- 5. Do you worry excessively about all the things that might happen? ..... Yes No 🗆
- 6. Are you really concerned about the safety of No 🗆 your men? ..... ..... Yes 🗆
- 7. Have you kept abreast of your job? ...... Yes 8. Are you aware of the dignity of your job? ...... Yes
- 9. Do you regard your "papers" as your major qualification? ..... Yes No 🗌
- 10. Are you truly competent? ..... Yes

#### one solid source...



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ROOF BOLTING UNITS Engineered especially for roof bolting



LOCKTITE CLAMPS For all shapes and sizes of tralley wire

100



COMBINATION TROLLEY CLAMPS Trolley wire



and feeder (up to 1,500,000 C.M.) may be

SECTION INSULATORS WITH SWITCH



For all sizes of trolley and feeder wire. Available with either quick-break or slowbreak switch:



FUSED TROLLEY TAPS



an cable, duce pullouts to a

"NO-LOSS" EXPANSION BOLTS

Both 4" and 6" cases, 34" bolts in vorious styles





100 amp to 2500 amp with or without enclosing box

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and the exclusive Elreco Inverted Trolley System that eliminates trolley poles and nips...makes motor operation safe...cuts maintenance 90%!

Depend on this complete line of trolley material for every type of mine operation. Every product in the line is the best we know how to make. You'll want our new catalog. Write me personally for one.



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A COMPLETE LINE OF TROLLEY MATERIAL FOR EVERY MINE 2900-18 CORMANY AVENUE . CINCINNATI 25, OHIO

#### **Evaluating Yourself**

The answers to Questions 1, 4, 6, 7 and 8 on p 114 should be "Yes." The answers to Questions 2, 3, 5 and 9 should be "No." Concerning the answer to Question 10, it's your deal! Here are the reasons

for our answers.

1. Seems like a silly question. However, there have been instances where men yearned for supervisory positions, then were stunned by their increased responsibilities after achieving the heights. Also, some men would much rather do a job themselves than tell others to do it. They haven't realized this until after they try to supervise. In evaluating yourself you must think deep, and if, after careful self-appraisal, your answer to the first question is "Yes," then you are where you belong and your chances for progress are excellent.

2. Some men are self-conscious when telling others what to do. There is no good reason for feeling that way if your orders are legitimate and sensible. Some practical hints for overcoming self-consciousness, if you are so inclined, are (1) have a clear idea in your own mind of the work you want done,
(2) tabulate the elements of the job and organize your thoughts around these elements and (3) arrange your orders before you begin to talk so that all elements will

be clearly explained.

3. The day you became a supervisor you lost your right to close your eyes to any violation of safety rules or to any indication of sloppy work. Furthermore, the tendencies your men exhibit toward sloppiness or hazardous practices not be malicious, but merely a reflection of supervisory laxity.

Your job is to correct such conditions as you see them. If you don't, the men have a perfect right to take it easy. After all, that is what

you're doing.

4. If any member of your boss's team drags his feet the whole team becomes an also-ran, with the result that no one on the team can receive credit for a good job, Make every effort to appreciate the problems of your superior and strive to get the picture of what he is trying to do. Knowing what you know of the added responsibilities that go hand-in-glove with a supervisor's job, you can be certain that if you have heavy problems, his are weightier. So give him your wholehearted co-operation.

5. Be concerned, but don't worry. Be concerned enough to investigate the possibilities the future holds and to have ready plans for handling these possibilities. Don't worry because worrying is a fruitless occupation that wastes energy.

6. Showing concern for the safeof your men means that you take an active interest in their physical welfare, above and beyond the stipulations of rules and laws which you should consider to be minimum standards. Webster says concern is solicitude or regard for persons. If you are truly concerned, you make a practice of looking for accident potentialities and taking steps to eliminate them. We know your answer to this question is "Yes."
7. This is 1952! Keeping abreast

of your job demands real effort, in view of the current rapid progress in mining technology and human relations. Keeping abreast of your job is no longer a matter of choice. Those who can't keep up and those who won't keep up soon find it almost impossible to discharge the duties of a mine supervisor in a satisfactory manner. Keeping in step demands that you sharpen your observation of people, places and situations, read as much as you can, absorb the experience of your mining elders, attend as many technical meetings as you possibly can, confer with your fellow supervisors and think.

8. Years ago, a mine supervisor held a position of eminence in his community because he had put forth so much effort to prepare himself for a load of responsibility. The same is true today. Then and now, dignity springs from the respect others have for you and the self-esteem you have for yourself and your life's work. Remember the impression your first supervisors made upon you during your early days in mining. Other young men now look at you through the

9. You had to have your certificate to get your job, but papers will never hold that job for you. Prior to the examination that led to your certification, you probably joined a group of other students to "bone up" for the test. The studying you did then was only a taste of the

same eves.

taste of the necessary studying ahead of you, wasn't it? Winning your certificate was only the beginroing. The point is: if you don't grow, you won't go! It is your job, not any person, that sets the stand-

ards you must meet. 10. There is a difference be-

tween being just adequate and being truly competent. For example, a fireboss starts his run on intake air and follows the air through his section. Why? An adequate boss will follow the air, but a compe-

tent boss knows why he does so. Your answer to this question, No. 10, will depend upon your definition of competency. We hope your eagerness to continue to learn permits you to answer "Yes."

his crew and passengers were safe and his employers, Isbrandtsen Lines, agree that he could have abandoned ship or remained. The decision was Captain Carlsen's.

We assume that to a man like Cap-tain Carlsen, who appears to hold solid, "old-fashioned" ideas concerning the right way to do a job, it made no difference whether the cargo was gold bullion or sawdust. He had assumed responsibility for ship and cargo and would deliver it or see it

consigned to Davey Jones.

Furthermore, the master of a vessel in trouble is in no position to predict what the decisions of admiralty courts might be concerning the later ownership and salvage rights of an unattended ship. The only sure way unattended snip. The only sure way to protect property is to keep physical control of it. Perhaps these were the captain's reasons for staying put. The Flying Enterprise could not quite make it, but to the great relief

of all who followed the story, Captain Carlsen and a British seaman who joined him were rescued. For a while, at least, a tale of courage drove more sordid stories off the front

page.
We bring Captain Carlsen's story to Foremen's Forum for two reasons: 1. Mining men will appreciate the skipper's position because they sometimes face similar situations in their daily bouts with natural forces.

2. The captain's actions are a bright example of how a conscientious supervisor discharges the responsibilities he

has voluntarily accepted.

Note the order of his decisions. First, the captain looked to the safety of the people for whom he was re-sponsible. He set up a plan which put each passenger in the company of a crew member to give a better chance for survival to those who were least prepared for the tricky business of abandoning ship.

Then he recognized his next obliga-tion-fulfilling the bond he had made with his employers to guard the ship and cargo to the human limit. There is more than cold economics here. There is the traditional concern of seagoing supervisors for the men and materials in their care. The same concern is inherent in coal mining.

The lessons for mine supervisors in Captain Carlsen's recent experiences

might be listed as follows:

1. Reach out for all the knowledge you can find that might have value in an emergency. According to the press, Captain Carlsen is the same skipper who some time ago performed an emergency appendectomy to save the life of an ailing seaman. Why a sea captain studied surgery is beyond us, but he did and the knowledge was applied.

2. Plan ahead in the calm periods so the plans will be ready when the pressure reaches a maximum. Planning under stress is difficult.

Know your responsibilities and, what's more, be ready to shoulder them when the situation calls for such action.



Get fused taps off of the trolley wire, out of the current collector path, with Trolley Tap Stations like this. Made with O-B Clamp-Type Contacts and a length of trolley wire or rod, the station is easily clamped wherever it is needed. Current collectors pass the station without interruption of current going to the locomotive or to equipment served by the taps.

Make your tap station any length, and hold the taps at any desired distance from the trolley wire, by shaping the trolley wire or rod between the clamps to suit your needs.

Two O-B Clamp-Type Contacts with Rubber

Handles, No. 22269, are needed for one station. Why not order several sets for a trial at some of the busy spots along your haulage system? You'll quickly see how easy it is to keep haulage traffic moving past power-tapping points!



CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

# Operating Ideas





UNDERINFLATION (left) and impact wounds (right) are death on tires, third largest cost item in truck-fleet operation.

#### Proper Tire Maintenance Cuts Cost and Lengthens Tire Life

TIRE ENGINEERS estimate that 70% of all premature truck-tire failures can be traced to lack of rigid maintenance programs and improper inflation. Although tires are the third largest cost item in a trucking operation, some fleet operators place new tires on vehicles and expect maximum wear without giving any attention to maintenance, says J. E. Powers, manager of truck and bus tire sales, B. F. Goodrich Co.

Mr. Powers points out that of the five components of a tire-air, inner tube, carcass, flap and rim-the most important is air. The tube is simply a container to hold the air. The carcass provides the necessary strength to hold the envelope of air. The flap prevents the tube from chafing on a rusty rim, prevents chafing by the toe of the bead and keeps out brake drum heat. The rim holds the assembly together and permits it to be mounted on the vehicle.

Excessive heat, an enemy of rubber, is caused by three contributing factors—load, inflation pressure and speed—Mr. Powers says. The most economical speed, both for gas mileage and tire life, is 40 mph. At this speed, a tire will build up from 5 to 8 lb pressure. At 50 mph.

the increase in pressure will be from 10 to 15 lb, and at 60 mph, from 15 to 25 lb.

A tire that is 40% overloaded will deliver only half the expected service. Underinflation causes abnormal flexing which results in overheating and possible breaks in the sidewall or shoulder.

Mr. Powers recommends that truckers use Tire and Rim Association charts as guides to proper inflation, and that speeds be held within reasonable limits. High impact, which increases the danger of tire damage is a direct function of speed and load.

#### A Newcomer, Porcelain Enamel, Reduces Corrosion and Improves Coal Handling

HEAT- AND ACID-RESISTANT porcelain enamels, bonded to exposed surfaces on coal-handling chutes and screw conveyors, have improved the flow of coal by reducing friction and increased the life of the parts by offering protection against corrosion at the Trenton, N. J., plant of the Thermoid Co.

The plant burns anthracite which moves from an overhead supply bin across the face of five boilers by gravity chute. The gravity chute feeds individual hoppers, and screw conveyors move coal from these hoppers into the boilers.

The pitch of the gravity chute was limited by the available overhead clearance to a gradient that did not permit efficient movement of the coal. However, the lower coefficient of friction of the porcelain coating permits the coal to move more easily, thus providing an additional advantage, less wear on the chute.

Plant engineers, working with engi-

neers of the Erie Enameling Co., Erie, Pa., applied high-gloss porcelain enamel to the conveyor screws and housings in an effort to prevent excessive corrosion. Subsequent experience shows that the service life of the conveyor parts is about doubled and power consumption is down about 35%, as compared with other coatings. The increase in life is attributed to the corrosion resistance of the porcelain, and the reduced power requirements to the low coefficient of friction of the new material.

The porcelain enamel developed for this application is of medium hardness to balance abrasion-resistance with impact strength.

#### Mine Official Reports 37.5% Lower Bit Cost

Officials in an Armstrong Co., Pa. mine report that Kennametal Mining Machine Bits result in 37.5% more cutting per bit life as compared to other carbide bits that have been used. Total tonnage: with other carbide—3,126 tons, with Kennametal—4,994 tons. Service between bit changes was increased from 9 places to 14 places. Bit life was 37.5% longer.

#### Matthews, Moore Coal Co., Gets Answer to Power Problem



Results of power test made for Mr. Claude Matthews, Supt., Moore Coal Co., Devonia, Tenn., show that Kennametal U-5-H Bits require

29% less power than steel bits. Test was made by a West Virginia consulting company. Particulars are: The machine using steel bits averaged a load of 52 H.P. on the motor while Kennametal averaged 37 H.P. or 29% lower average power. The machine which was rated at 50 H.P. operated at a 2 H.P. overload when steel bits were in service.

#### Bit Cost Reduced to .58 cents per ton, Clymer No. 2 Mine, Clearfield Bituminous Coal Corp.



J. F. Simpson, Mine Superintendent, says, "We have used Kennametal Bits for three years and they have cut 284 places per

set." Prior to the use of U-7 Bits at the mine, complete bit changes or resettings were made on each place that was cut. Bit cost averages only .58 of one cent per ton.

#### Booklet on Mining Bits Available for the Asking

New styles, sizes, prices and performance data on Kennametal Bits are available in new Mining Catalog M-6 published by Kennametal. You can have a copy by writing us and asking for it.

(Advertisement)

**Duquesne Light Co.'s Harwick Mine** 



#### with Kennametal Bits



James H. Truax, mine superintendent, says, "We checked the performance of 100 Kennametal U-4 Bits and found that they gave a bit cost of \$.0026 per ton, which we consider very good." The cutting was done in a section of the mine where the coal was only medium hard to cut, and in other sections where it was more difficult, the U-7 was put on test. The record there, according to James Truax, was also satisfactory. He says, "The U-7 Bits have helped to make a difficult cutting job easier and more profitable." In this cutting, 14 places were cut between bit changes and 50 places were cut per set of bits.

Beside lowering bit cost, other advantages that are obtained by using Kennametal Bits are more efficient cutting because fewer stops are made to change or set bits, a large saving is also made on machine repair because the bits stay sharp and allow it to cut freer, and due to less changing and fewer dull bits, the cost of bit reconditioning is greatly reduced.

One of our service representatives who deals only in cutting and drilling problems will be glad to explain how Kennametal Bits can be cost-savers for you. Kennametal Inc., Latrobe, Pa.

The name of your nearest Kennametal representative can be found in your McGraw-Hill Mining Catalog. Contact him today.

#### KENNAMETAL



DRILL BITS . MACHINE BITS . ROCK BITS . ROOF BITS

Bits for Every Cutting & Drilling Need

#### Three Ideas for Safer, More Efficient Operation . . .

Turned up in thumbing through recent issues of other McGraw-Hill publications. Looking for applicable kinks in other industries is a good habit to form.

#### Air Motors Convert Clamshell Into Shaft Mucker



JESS GLAESER, project manager for Perini-Walsh, the contractors on a tunnel job at Niagara Falls, made a mucking machine out of a clamshell bucket by installing two air motors, according to an article in the November, 1951, issue of Construction Methods and Equipment.

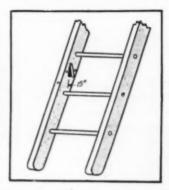
Mr. Glaeser's mechanics attached two Ingersoll-Rand Tugger hoists to the main frames of the bucket and welded a strapiron bosun's seat to one of the frames. The operator rides this seat, so the hoist throttles were placed within his reach.

As shown in the photo, the rig hangs from a hook which can be spotted about 20 ft above the bottom of the shaft. One hoist, operating through a multiple block line, raises and lowers the bucket through the 20-ft range, and the other hoist opens and closes the clamshell. One airline serves both motors. Hand-controlled taglines spot the bucket over the pile for loading and over the skip for unloading.

In addition to speeding up the mucking operation, the job-engineered unit has eliminated hard labor.

The two shafts in which the mucker has stepped up operations are 26 ft in diameter and 300 ft deep. The dropline, from which the rig is suspended, may be the load lines of a crane or a line over the head frame.

TWO AIR MOTORS, one for raising and lowering and the other for opening and closing the bucket, converted a clamshell into a shaft mucker.



#### Gage Shows Safest Ladder Angle

SAFETY ENGINEERS agree that the safest angle for using a straight ladder is 15 deg off vertical, writes L. Kasper, Philadelphia, Pa., in a letter to Power .nagazine. At this angle there is least tendency to slip or break under heavy load. To eliminate guess work in determining the 15-deg angle, screw a piece of flat stock loosely on the inside of either runner at a convenient height. Then set the ladder at 15 deg and mark the outline of the gage piece. Fill the outline with color, and the next time the ladder is used set the feet so that the color is obscured by the flat piece. This insures a 15-deg angle. Two screws prevent the gage from extending beyond the edge of the runner.



#### How To Paint Where a Brush Won't Go

IF YOU HAVE THE PROBLEM of getting a coat of paint on confined surfaces, such as the radiator tubes on a transformer, do what Westinghouse Electric Corp. does. Take a strip of rubber from an old inner tube, dip it into the paint and wipe the paint onto the hard-to-reach surface with a shoe-shine motion.

You'll save time and paint and get complete coverage, according to Factory Management and Maintenance.

SEE YOUR IDEA IN PRINT-Other coal men will profit from learning how your good "Operating Idea" works and COAL AGE will gladly pay you \$10 or more for each usable idea, on publication. Just write: The Editor,

COAL AGE, 330 W. 42nd St., New York 36, N. Y.

# give your truck engines a chance to perform at their best!



Specify Eaton 2-Speed Axles; they double the conventional number of gear ratios, enabling drivers to select a ratio for pulling power or speed, a ratio best suited to road and load conditions. This permits engines to operate in their most efficient and economical speed range, cuts gas and oil consumption. It reduces stress and wear on engine and power transmitting parts, holds maintenance time and cost to a minimum, adds thousands of miles to engine and over-all vehicle life. Your dealer will explain how Eaton 2-Speed Axles will help your trucks haul more, faster, at lower cost. They pay for themselves over and over, and give trucks materially higher trade-in value.

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CLEVELAND, OHIO

These Exclusive Eaton Features Keep Trucks on the Job, Reduce Upkeep, Add Thousands of Miles to Axle Life—

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PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

# It'll soon be 21!

For 20 straight years Internationals have been first in heavy-duty truck sales.

It will soon be 21. Another year will be added to International Trucks' heavy-duty leadership because truck operators who know hauling costs will continue to prefer the trucks that give them lower operating and maintenance costs, longer truck life.

If you are interested in these money-saving advantages, why not see your International Truck Dealer or Branch about the truck engineered for your job?

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#### Check these exclusive advantages of Internationals:

- All-truck engines—exclusively for truck work—built in the world's largest truck engine plant.
- The "roomiest, most comfortable cab on the road" the Comfo-Vision Cab designed by drivers for drivers.
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- 115 basic models . . . everything from ½-ton pickups to 90,000 lb. GVW off-highway models.
- · America's largest exclusive truck service organization.



International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power. . . Refrigerators and Freezers

# Model UF-194, 145 Inch wheatlone, 9x7ft, dump body, 38,000 lbs. GVW.

#### Cuts and loads 2 tons a minute with help of 86 TIMKEN bearings

THIS Lee-Norse Miner Cut a 9½' seam 12½' wide. It It cuts and loads coal at the rate of 2 tons a minute. To maintain this output-day in, day out-time-out for maintenance and repairs must be held to a minimum.

One important way Lee-Norse Company builds trouble-free performance into its "Miner" is by using a total of 86 Timken® tapered roller bearings in the cutter heads and on vital shafts throughout the machine.

Timken tapered roller bearings have exceptional load carrying capacity because of line contact between rollers and races. They withstand the heavy shock loads which occur during cutting operations.

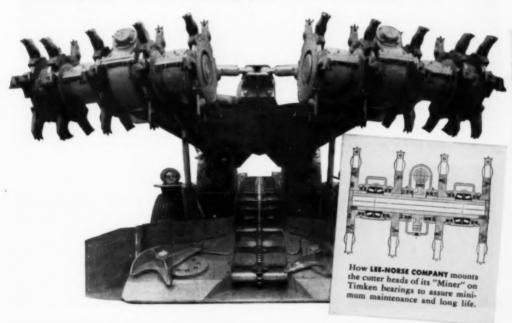
Timken bearings keep housing and shaft concentric, make closures more effective. Lubricant stays in, reducing maintenance. Dirt stays out, reducing wear. Since they take radial and thrust loads in any combination, Timken bearings hold shafts in rigid, positive alignment,

insuring proper gear meshing at all times.

Timken bearings give you more advantages than any other bearing. Make sure they are in the equipment you buy or build. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.





#### FINISHED TO CLOSER TOLERANCES

Finishing to incredible smooth-ness accounts for much of the precise, smooth rolling perform-ance of Timken bearings. This honing operation is typical of the amazingly accurate manufac-turing methods at the Timken Company.

ack nowledged leader in: 1 advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels



TAPERED ROLLER BEARINGS



NOT JUST A BALL 💮 NOT JUST A ROLLER 🥽 THE TIMKEN TAPERED ROLLER 📁 BEARING TAKES RADIAL 🗓 AND THRUST 📲 — LOADS OR ANY COMBINATION



# Equipment News





#### New Self-Contained Rotary Roof Drill for Easy Maneuvering (1)

A self-contained unit, 29 in high and 36 in wide and weighing approximately 600 lb, the newly announced Crichton wet rotary roof drill is an inexpensive unit with true vertical lift and a 30-in tool pass mounted on a 14-in pneumatic-tire 3-wheel carriage for easy positioning

and quick maneuvering in the face area, the maker says. The drill head is powered by a short flexible shaft from a sturdy 3-hp permissible motor, which can also be used to power the Crichton coal drill. Among the features cited by the manufacturer are: a tool speed of 600 rpm:

carbide-tungsten-tipped bits; a pump capacity of 2 qt per minute; water-tank capacity of 16 gal, sufficient for 32 drilling minutes; and manual operation by hydraulic lift. Circle No. 1 on the postage-free card facing p 128 for full details from The Crichton Co., Johnstonn, Pa.



#### AC Control Center Simplifies Installation and Maintenance (2)

A completely new G-E motor-control center designed for use where two or more AC motors up to 200 hp, 600 v, are controlled from a central location is pre-engineered, factory wired and assembled and employs many standard components and accessories. According to G-E engineers, it provides simplified installation and servicing of AC combination motor starters in NEMA Sizes 1 through 5, as well as lighting panels and associated equipment, and will withstand short-circuit stresses up to 25,000

amp. An important feature cited by the maker is a 4-in vertical trough (with cable supports) which runs the length of each section to provide ample space for wiring without "threading" or "fishing." Easily removable, and units may be installed from front or rear and are made in even multiples of 14, permitting a variety of arrangements and easy interchangeability. 24-p Bulletin GEA-4979A gives full information.—General Electric Co., Schenectady 5, N. Y. (Circle No. 2 on postage-free card.)

#### Preparation Unit Offers Dual Action (3)

Newly announced Wemco Attrition Machine is said to effectively produce two broad effects on material treated, either singly or in combination depending on the problem. For treatment of mineral-particle surfaces, the unit has proved effective, the maker says, in the removal of slime, and oxidized and reagent coatings undesirable in further processing, with a beneficial cleansing and polishing action. In treatment of particles held together with a cementing material, the attrition machine may be applied to their liberation. Its operating principle is based on the controlled turbulence of highdensity pulps, with an action that simulates the rubbing of particle against particle. The machine is made up of two, four or six octagonal-shaped cells in series, with each cell having a motor-driven vertical impeller shaft on which are mounted three 6-bladed impellers whose pitch is alternated from cell to cell-Western Machinery Co., San Francisco 7.



February, 1952 - COAL AGE

### **Material on Mining Bits**



Proper instructions, vitally important to the correct use of carbide tools are available on mining machine bits, coal auger bits, strip bits, and

rock bits. They are thorough, timetested, and reliable. Write Kennametal Inc., Latrobe, Pa., pioneers and world's largest manufacturers of cemented carbide mining tools.

A complete tool catalog is also available that gives specifications, prices, and performance data on Kennametal Mining Tools. Specify M-6. Any of the above material will be sent to you on request.

### New Bit Rotary Drills Bolt Holes in Laminated Sandstone

Drills hundreds of feet in hard roof



To give the greatest wear resistance in drilling hard roof, the Kennametal HFD Bit is tipped with a thick insert of Kennametal cemented carbide.

The bit fits into regular Kennametal Roof Bolting Rods. It is powered by ordinary electric drills. Material drilled with the bit is slate, shale, and laminated sandstone. The four main features of the bit are: (1) Smoother hole without rifling, (2) Longer gage life in hard roof, (3) Easy bit sharpening, (4) Lower bit cost than obtainable with any other bit used for drilling medium hard mine roof. Sizes are 1¼-inch to 2¼-inch, prices range between \$4.85 and \$14.80, depending upon size and quantity.

#### Machine Bits Bore Rock



Six regular mining machine bits act as cutting teeth in this rigidly constructed bit used for rock boring. The "teeth" are set in a heavy cast steel

head. They are secured by set screws which allow them to be removed for sharpening when dulled. Drilling speeds are 3' to 3\%' per minute in average drilling. Feature: Ability to drill hard rook formations. Style' is UD 6\%''. The price, including bits, is \$45.10 to \$59.40 depending upon quantity. (ADVERTISEMENT)



Two things make it possible for a bit to achieve a fortieth life. One is its high quality Kennametal tungsten carbide cutting edge and another is the kind of maintenance that is given to it. Poor or improper maintenance is, in most instances, the reason for early fatality. Is your Kennametal Bit changed when it gets dull? Is it reground according to recommended sharpening methods? If not, then a forty-life bit is improbable, and cost sacrifices are made in terms of lower drilling speed, higher drill maintenance cost, higher bit cost.

Under average drilling conditions, where the drilling is largely done in coal with only minor quantities of impurities, the Kennametal Drill Bit can, if properly cared for, give 4,000 feet or more of service or a hundred or more feet of drilling per sharpening. If your performance is less, it may be advisable either to look carefully yourself to be sure the right precautions are being used or better, ask your Kennametal representative to give your procedures a once-over. He knows from daily experience the ways in which bit service can be improved. The way to get maximum life, 40 lives if you're in average coal, is to remove the bit when dull, sharpen it as per the instructions that are prescribed by your Kennametal representative. Kennametal Inc., Latrobe, Pa.

Names and addresses of Kennametal representatives appear in your 1951 McGraw-Hill Mining Catalog.



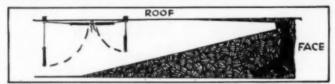
#### **GRINDING INSTRUCTIONS**

For the best service life on your tungsten carbide mining tools, they should be reconditioned at regular intervals and according to proper procedures. Conserve bit life by following proper grinding techniques. Write today for a copy of our complete, fully-illustrated folder on proper bit maintenance.

### KENNAMETAL.

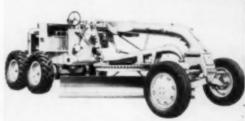
Bits for Every Cutting & Drilling Need

### Colored Center Rods Permit One Man to Do Work of Two (4)



"Scotch-Lite One-Man Center Rods" are covered with a different-colored reflecting material and make it possible for one man to take centers where two men are usually required. In use for setting straight timber lines and lining up track and wire, a light is directed from the working face to rods hung in spads to line them together. The rods can be tied up when necessary and by leaving them hanging in spads immediate reference to centers is possible at all times, thus making mining faster and after and eliminating later cost. The rods are 5/16 in in diameter, 16 in long and, for best results, are hung on spads set about 15 ft apart. Full details from the inventor, J. G. Callihan, Madison, W. Va.





#### '52 Truck Line Includes Varied Models (5)

The 1952 Chevrolet truck line combines new improvements with tested features to provide the truck operator with outstanding economy and durability and the driver with superior comfort, safety and handling ease, the company reports. The line covers models in 22 series on 10 wheelbases, with gross vehicle weights ranging from 4,000 to 16,000 lb. An important improvement is more efficient carburetion providing smoother performance during warm up, and the units are again powered by either of two valve-in-head engines, the 92-hp Thriftmaster or the 105-hp Loadmaster. Chevrolet's 4-way lubrication system and controlled cooling, important factors in peak performance and long life, are continued along with major chassis and design features. Greater cab comfort, more visibility and better ventilation also are emphasized.—Checrolet Motor Div., Detroit 2.

### Two Motor Graders for Tough Jobs (6)

Two completely new motor graders, Models AD-40 and AD-30, complete an Allis-Chalmers line of five motor graders with a wide range of power, weight and speed and include design and construction features offering new standards of performance, unmatched operating ease and complete service simplicity, the maker says. Made for the toughest grading and maintenance jobs, the 4-cylinder 2-cycle diesel-powered AD-40 weighs 23,000 lb and develops 104 bhp. The AD-30 is powered by a 3-cylinder 2-cycle diesel engine, weighs 22,700 lb and develops 78 bhp. The General Motors 2-cycle diesel engines meet heavy-duty power requirements and tandem drive offers full traction under any ground conditions, it is said. Accessibility to major assemblies, for service and repair, are among other important features of the unit. Details from the Tractor Dic., Allis-Chalmers Mig. Co., Milwaukee I, Wis.

#### New Units Provide More Accurate Coal Samples (7)



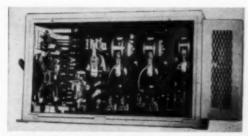
Two newly announced Holmes laboratory hammermill crushers (left) and pulverizer model (right) reflect continued improvement of units in use for



many years and offer uniform, economical and simplified sample preparation, the maker says. The Model 2-B crusher for 2-in nut and screenings handles 1,000 Ib per hr; while Model 4-A for 6-in egg and smaller has a capacity of 2,500 lb per hr. Features cited by the maker include precision-made sample containers in two sizes easily removed and fully interchangeable; a self-feeding hopper; and an easily opened crusher chamber for quick changing of screen plates and cleaning. The Model 3-A dust-tight pulverizer for intermittent grinding has a high grinding rate and a quickly opened chamber for speedy screen changing and cleaning. Full details in Bulletin 103 from Robert Holmes & Bros., Inc., Dan-tille, III.

#### THE POSTAGE-FREE CARD

... facing p 128 will bring you more details on any item in this section without obligation. Just circle the numbers, sign card and mail.



### Adjustable-Speed Starter for Belt Control (8)

New Ensign-Clark Type ADJR reversing starter designed for controlling two-speed belt-conveyor motors is said to accelerate motor up to its low or base speed with full shunt field providing maximum torque through either two or three resistance steps. Other features cited by the maker include an adjustable speed, 2:1 ratio, when used with adjustable-speed motor; interlock on reversing switch providing half speed only on reverse; speed-up from remote pushbutton for shuttle-car dumping; auxiliary contacts insuring against damage to belt from slippage; and three-position selector switch providing independent or sequence operation. The unit is made in several sizes, for 230 or 550 v, DC, with open-type enclosure. Bulletin 5390 with full operating data from Ensign Electric & Mig. Co., Huntington 4, W. Va.



### Coal Haulers Meet Stripper's Problems (9)

Sterling-White coal haulers said to be "engineered for the job" and designed for specialized service include seven new Model HB2755D 6-wheeled units recently put in operation by the Dick Construction Co. at its stripping near Clarksburg, W. Va. The units have a 179-in wheelbase, are powered by a 165-hp diesel engine and have 12 forward speeds and three reverse, with a wide gear-ratio range to easily negotiate grades of 8 to 15%. They are equipped with special coal bodies of 25-yd capacity with full cab protectors and heavy-duty double telescopic hoists. In operation, the trucks are handling payloads averaging 18 to 20 tons and top speed is 40 mph.—White Motor Co., Cleveland 1.

### Neoprene-Base Coating Prevents Corrosion (10)

Gaco Maintenance Coating, a Neoprene-base liquid suitable for brush or spray application, coats pump parts and piping, valves, structures, mine cars, underground machines and other mine units and installations exposed to the corrosive effects of harsh weather or mine water. Maintenance Coating also provides good resistance to abrasion, fumes, oil and high temperature, and a good bond between metal and coating is assured after prope: application and drying, the manufacturer says. Other products in the line are a putty-like material which can be vulcanized into belt and cable-jacket defects, and a skid-proofing compound for stairways, floors, ramps and so on. Full details from The Crichton Co., Johnstown, Pa.

### Heavy-Duty DC Contactors Reduce Maintenance (11)



New DC contactors for steel mill and other heavy-duty industrial applications, known as Westinghouse Type M, are accessible from the front, with alignment independent of the accuracy of panel drilling and only three mounting holes required. Their unit construction reduces maintenance resulting from misalignment of separately mounted contactor the maker says. Available in all NEMA ratings from 25 to 2,500 amp, Type M contactors feature self-cleaning knifeedge bearings unaffected by dust and also incorporate a new-type are box to provide faster are interruption and maintain correct alignment with the moving armature. Further information from Westinghouse Electric Corp., Pittsburgh 30.



### Motor Line Protected Against Moisture (13)

R&M line of "All-Weather" electric motors are completely "Weatherized" for protection against damaging condensation and damp weather which so often cause premature failure, the maker reports. Special treatment for rotors, steel and cast-iron parts prevents rust, corrosion and rapid deterioration of insulation and pre-lubricated fully sealed ball bearings also add to long trouble-free service under various conditions, it says. The motors are made in the following types and horsepowers: single phase and DC, 1 to 7½ hp; totally enclosed fancooled and explosionproof, 1 to 40 hp; and polyphase, 1 to 50 hp. Full details in Bulletin 400 from Robbins & Myers, Inc., Springfield 99, Ohio.



### Non-Corrosive Tubing For Varied Uses (14)

Its great flexibility and resistance to all kinds of fumes and solvents make Flexflyte an ideal portable ducting for removal of exhaust gases in garages and shops and for piping air to remote parts of mg sets and other equipment located in hard-to-get-at places, the maker says. For air conditioning, Flexflyte can be snaked through walls as easily as BX cable to permit rapid installation in existing structures. Made of a glass-fiber fabric cemented to a continuous steel-spring wire helix, the tubing is flameproof and resistant to fungus and mildew. Stock-



For Maximum SAFETY SPEEDI DEPENDABILITY III Take ...

### FF-NORTON

No. 514-MT for THIN SEAMS



Mine

No. 516-MT for MEDIUM SEAMS



The three Duff-Norton Jacks illus trated simplify selection of jacks for thin, medium and thick seam mines. All are of five ton capacity . the 514-MT is 14" high with a 716"lift . . . the 516-MT is 16" high with a 916" lift . . . and the 521-MT is 21" high with a 1419" lift. These jacks perform every lifting and lowering job with ease. For quotation, specify jacks by number.



No. 521-MT for THICK SEAMS



### STURDY SPRING

This world-famous patented spring mechanism is an adjustable, selfcontained unit, that assures positive pawl action. Jacks cannot be tripped under load, safeguarding men and equipment.

Write today for the "HANDY MINE JACK GUIDE

DUFF-NORTON MANUFACTURING CO.

MAIN PLANT and CENERAL OFFICES, PITTSBURGH 30, PA .- CANADIAN PLANT, TORONTO 6, ONT

"The House that Jacks Built"

keeping is minimized since it can be easily cut with simple tools. Full data from Flexible Tubing Corp., Guilford.



### Cloth-Bag Collector Handles Fine Dusts (15)

New cloth-bag collector for carbon black and various other dusts with similar characteristics features a simplified design of filter bags and mechanism for reclaiming dust from bags that provide dust control at low equipment and installation cost, the maker says. Pangborn collectors range from 5 to 40 ft long, contain from 1,360 to 10,880 sq ft of filter cloth and have one to six hoppers, with appro-priate structural supports for various types of disposal. Minimum parts, simplified design and easy accessibility provided by a walkway between suspended bags make it possible to maintain and inspect the collector easily and without tools. Dust captured in the bags is removed by turning on the shaker motor through grid openings into the hoppers which discharge through valves. Details from Pangborn Corp., Hagerstown, Md

### Four New Lubricants for Specific Uses (16-19)

Following extensive laboratory and field research, The Texas Co., New York. has introduced four new special-purpose lubricants developed to meet specific application factors. For more detailed data on them, circle the numbers given on the postage-free card following:

(16) Wire-Rope Lubricant - Texaco Crater A, offering improved wettability over the former product of that name, features unusual penetration and adhesion to permit application to wet wire ropes, during severe weather conditions or where cable is subjected to abnormal water conditions, the maker says. It is applied without heating, will not drip or evaporate in hot weather or harden or chip in cold weather.

(17) Improved Multi-Purpose Grease Texaco Multifak 2 Grease is recommended by the maker for use where one highgrade multi-purpose grease is required for a variety of industrial operations. It features excellent shear stability, resistance against water washing, good pumpability

2,574,000 TONS CRUSHED COAL

(WITHOUT OVERHAULING)



23 Year Old AMERICAN CRUSHEB Now Ready For **NEW Career** 



Far from being ready for retirement, the 23-year-old American Crusher, whose rotor is shown here, was recently overhauled and transferred to its new home at the Arkwright Mine in Morgantown, West Virginia-where it is now prepared to start a new and productive life.

Since 1927 this mechanical "old faithful" has reduced over 21/2 million tons of 6-inch lump to minus 3/4 inch screening-at a total parts-replacement cost of only \$.0007 per ton (including the recent reinstallation costs).

Only such features as the exclusive, patented Shredder Ring-originated and perfected by American-could produce such long-lived, economical performance as shown in this typical case history. When you plan to purchase a coal crusher, plan to investigate the built-to-produce American Rolling Ring Crusher.

WRITE for Bulletin
"CRUSHING COAL AT LESS
THAN 1¢ PER TON"

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 MACKLIND AVE. ST. LOUIS 10, MO.

Introducing a Revolutionary

### **WILMOT-DANIELS Heavy-Density Unit**

Completely Eliminates Loss of Product to Refuse. Cuts Requirements of Costly Magnetite Medium Sharply Maintains Remarkably Constant Density of Bath.

The remarkable operating records of the new Wilmot-Daniels Heavy-Density unit have given real substance to its title of "revolutionary". Its sharp advances in efficiency, yield and quality control are suggested by the field records shown here. Featuring also radical simpli-

You Are Invited TO SEE the Wilmot-Daniels Heavy-Density unit installed at the Indian Head colliery, Tremont, Pa., pictured below. TO READ the article about the Wilmot-Daniels Heavy-Density cleaning process which appeared on pages 90-93 of the January

issue of Coal Age.

city and compactness, it has cut costs in a way that means new carry-over to profit for coal and metal producers. May we send you a file of field test reports together with engineering details?

#### BATH SPECIFIC GRAVITY

Circuit 1 Circuit 2

		Process 1	Girconic 4
7:00	AM.	1.65	1.71
7:30	AM	1.65	1.71
8:00	AM	1.65	1.71
8:30	AM	1.65	1.71
9:00	AM	1.65	1.71
9:30	AM	1.65	1.71
10:00	AM	1.65	1.71
10:30	AM	1.65	1.71
11:00	AM	1.65	1.71
11:30	AM	1.65	1.71
12:00	M	1.65	1.71
12:30	PA	1.65	1.71
1:00	PM	1.65	1.71
1:30	PM	1.65	1.71
	7:30 8:00 8:30 9:00 9:30 10:00 10:30 11:00 12:30 1:00	7:00 AM 7:30 AM 8:00 AM 9:00 AM 9:00 AM 10:00 AM 11:00 AM 11:30 AM 12:00 M 12:30 PM 1:30 PM	7:30 AM 1.65 8:30 AM 1.65 9:30 AM 1.85 9:30 AM 1.85 10:30 AM 1.85 10:30 AM 1.85 11:30 AM 1.65 11:30 AM 1.65 11:30 AM 1.65 12:30 PM 1.65 12:30 PM 1.65

Left, Indian Head Coal Co., Tremont, Po.

2:30 PM	1.65	1.71
3:00 PM	1.65	1.71
3:30 PM	1.65	1.71
4:00 PM	1.65	1.71
4:30 PM	1.65	1.71
5:00 PM	1.65	1.71
	actual opera	

2:00 PM 1.65

at Indian Head colliery graphically demonstrate how the Wilmot-Daniel Heavy-Density unit unfailingly main-tains accuracy of bath density, result-ing in more efficient product cleaning.

#### HEAVY DENSITY PERFORMANCE

Test No.	Primary Fluat	Rete Bani	10 to
		CBAL	86m
1	*eirc.	0	0.5
2	circ.	. 0	4.0
3	circ.	0	2.5
3 4 5	circ.	0	3.5
5	circ.	0	2.0
6	circ.	0	1.5
7	circ.	0	0.0
8	circ.	. 0	1.0
9	circ.	.0	3.5
10	circ.	. 0	3.0
11	circ.	0	2.0
12	circ.	0	5.0
13	circ.	0	2.5
14	circ.	0	4.5
15	circ.	0	2.0
16	circ.	0	2.5
17	circ.	0	1.0
18	circ.	0	0.0
19	eire.	0	1.5

\*Indicates coal produced well within stand-ards for anthracite.

During normal operation at the couring normal operation at the Indian Head breaker the new Wilmot-Daniels unit showed that the common problem of loss of coal to refuse can, for the first time. or the first time, be eliminated.

HAZLETON, PA

WILMOT ENGINE

Plant:

HEAVY DENSITY DIVISION

### USE THIS CARD

...TO GET MORE INFORMA-TION on products and bulletins mentioned in this Equipment News Section or for data on any product advertised in this issue. Circle item numbers, tear out and mail. No postage is

at low temperatures and is suitable for bearing lubrication over a wide range of temperatures, it is said.

(18) Anti-Friction Bearing Lubricant

Texaco High Temp Grease is said to
considerably extend the efficient operating range of ball, roller and plain bearings, exceeding usual standards of protection up to 300 deg F for continuous
operation and 350 deg F in intermittent
operation. It reportedly has excellent
oxidation and water resistance.

(19) Rail-Joint Lubricant—Texaco Rail Joint Lubricant is a rust-preventing lubricant that can be spray applied regardless

#### YES-I would like more information . . .

Please send me catalogs or further information about the items from the Equipment News Section whose numbers are circled. (February 1952)

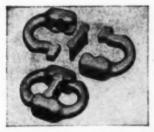
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2	6	10	14	18	22	26	30	34	38	
3	7	11	15	19	23	27	31	35	39	
4	8	12	16	20	24	28	32	36	40	

In addition, please send me data on these OTHER products advertised in this issue (give name and page number)

of moisture conditions, with unusual adhesiveness and water resistance, and minimizes hazards of rail misalignment and failure of signal systems from frozen joints, the maker says. It reportedly remains pliable at low temperatures, will not evaporate in hot weather and is relatively unaffected by prolonged and violent water washing.



### **Equipment Shorts You'll Want to Check**



(20) CHAIN LINKS—Wedglok Universal safety connecting links for carbon and alloy-steel chain of comparable size and require only two sizes to connect any size chain from % to % in. Designed for making chain or wire-rope connections or emergency repairs, Wedglok links also permit users to make up chain slings safely from running lengths of chain right on the job without special equipment. Bulletin 851UW available from Interstate Drop Forge Co., Milwaukee 16., Wis.

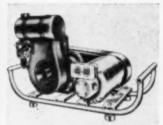
(21) NEW PROTECTIVE COATING known as "Liquid Stainless Steel," is said to consist of actual stainless steel reduced by a new process to microscopic flakes and combined with vinyl plastics to form a quick-drying liquid that will give a surface of actual stainless steel in coating form to protect against rust and corrosion. Usable on metals, wood, composition board, concrete and brick, it can be sprayed, brushed or dipped. Application

data in bulletin from Slip-On, Inc., New York 13.



(22) NEW BLUEPRINT CABINET files 1,000 blueprints, photostats, etc., safely and conveniently without wrinkles, creases or curied edges, with each print hanging smoothly and immediately accessible. With the Draw-in-Dex cabinet, any print can be removed without disturbing others and an index file locates the prints instantly, it is said. Full details in folder from Beruin Trading Co., New York 38.

(23) SELF-DUMPING TRAILER—Model T-SRF-N Phil-Dump trailer has a N yd capacity and was designed for three-way use-pulling by hand, lifting and transporting by fork-lift truck, and towing singly or in train by industrial tractor. Sized for handling by one man, the Phil-Dump is recommended by the maker for hauling and dumping raw materials, finished parts, scrap and other industrial products.—Phillips Mine & Mill Supply Co., Pitts-bulings Mine & Mill Supply



(24) NEW PORTABLE ELECTRIC GENERATOR, Model 1800, is a gasengine-driven unit in three general ratings, 1,000, 1,250 and 1,350 w, 115 v, 80 cycles, AC. Said to be suitable for many power requirements such as field operations, repair trucks, portable tools, flood lights, radio systems, etc., the units are equipped with a universal mounting base for use with one of several makes of engines and may be purchased with or

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sulating finishes, varnished cloths and tapes, sealing and filling compounds, and G-E silicone insulating materials are covered with accompanying photographs.

fully absorb shocks, increase component life, relieve equipment of structural fa-tigue and increase the production by

(34) PORTABLE HEATERS-Bulletin L-4782 on new line of Fageol heat machines explains the Fageol principle of spraying heated air out at floor level to form a blanket of warm air in the working area where needed, instead of overhead where it's wasted. Applications range from office and factory use to heating construction machinery, drying concrete and heating warehouses. Available from Fageol Heat Machine Co., Detroit 11, Mich.

(35) COAL-PROCESSING MACHINERY -Bulletin 100-A from Hardinge Co., Inc., York, Pa., describes its complete line of process machinery for mining and other industries. It includes new products added to the line in recent years and present details of design, construction and application for the entire line

(36) FLUORESCENT MERCURY LAMPS-Compact detailed information on Westinghouse JH-1 fluorescent mercury lamps is available in Booklet A-6007. with recommended applications, comparisons with other light sources and technical and transformer data. From Westinghouse Electric Corp., Lamp Div., Bloom-

(37) INDUSTRIAL LAMINATES-The numerous grades of G-E Textolite industrial laminates are fully described in Catalog CDL-38. Full details of mechanical. chemical, physical, thermal and electrical properties and tolerances permit selection of grades applicable to particular design problems. From General Electric Co., Chemical Div., Pittsfield, Mass.

(38) FOR BOILER MAINTENANCE AND OPERATION, new 24-p catalog and data book, "Boiler Settings With Plastic and Castable Refractories, helpful reference material on plastic and castable refractories and their application in modern boiler settings, together with information on refractory design, manufacture and installation. From Ramtite Co., Div. of S. Obermayer Co., Chi-

(39-40) VALVES-Circle 39 on postage free card for new 12-p Catalog 1800 covering the use of Honeywell Air-O-Motor diaphragm operators with North American adjustable port valves. Complete specification data is given covering valves for gas, air, oil, steam and water regulation. Circle 40 for Catalog 1700 on Honeywell Air-O-Motor diaphragm operators with Continental butterfly valves, with full data on both standard and heavy-duty types. From Brown Instrument Div., Minneapolis-Honeywell Regulator Co., Philadelphia 44.

without the engine. Literature from Wincharger Corp., Sioux City 2, Iowa.

(25) POCKET - SIZE CONTINUITY TESTER is designed to determine continuity of circuits and identify wires between terminals or in multiwire cable, and permit testing without live-wire connections with power from its own pen-lite batteries, the maker says. The Ideal tester requires only one hand and may be used in noisy areas because it uses a signal light indicator. - Ideal Industries, Inc., Sycamore, Ill.

(28) MAINTENANCE MEN seeking a floor patching and resurfacing material that can be kept on hand for ready use will find an answer in Trowel-In, which both repairs and resurfaces floors of practically any composition, the company says. Trowel-In repairs are ready for traffic in 18 hr and requires no heat or special skill in application. For resurfacing, it needs a thickness of only % in; for patching no chopping out of the old floor is necessary. Literature and trial order plan from Flexrock Co., Philadelphia 4.

(27) STABILIZED MASTIC FLOORING obtained by new process utilizing Unitahlite, a mineral stabilizer of high efficiency, is known as Texas Jack Resurfacer or high-density complete mastic flooring. This added stabilizer is said to impart strengths and resistances to the whole material so that ruffing, waving, and the transfer of irregularities from the old floor through the new mastic surface become practically non-existent. The "pull" on vehicular traffic is greatly reduced, indentation under static loadings is eliminated and propulsion effort is considerably reduced, it is said. Details in 12-p booklet from Flash-Stone Co., Philadelphia 44.

### EQUIPMENT BULLETINS AVAILABLE

(28) 10 FUNDAMENTAL SAFE PRAC-TICES recommended in changing tires, particularly on trucks and other commercial vehicles, are contained in an illustrated poster published by The B. F. Goodrich Co., Akron, Ohio. Measuring 11x17 in, it is suitable for posting in all places where tire changers work, using cartoons to graphically portray each of the 10 safety practices.

(29) SELECTION GUIDE FOR COAL MINING - Allis-Chalmers products of particular interest to the coal industryvibrating screens, centrifugal pumps, motors, motor starters, V-belt drive equipment, car shakers, and power and electrical equipment-are listed in a new 16-p guide. The bulletin reveals factors to be considered in selecting vibrating screens and describes their construction and applications. Construction features and ratings of pumps and motors are summarized and a table shows the scope of the company's line of motor starters. Bulletin 25B6280D is available from Allis-Chal-mers Mfg. Co., Milwaukee 1, Wis.

(30) HYDRAULIC TORQUE CON-

VERTER-Bulletin offers detailed data on Schneider hydraulic torque converters. said by the maker to offer greater simplicity, flexibility, efficiency and economy for installation in sizes from 5 to 5,000 hp on trucks, tractors, earthmoving ma-chinery, etc. Installation diagrams, performance and characteristics charts are included. Available from Schneider Mfg. Corp., Muncie, Ind.

(31) INSTRUMENTS AND CONTROLS -28-p Catalog 5000 describes the principal instruments, control devices and related components manufactured by the Industrial Div., Minneapolis-Honeywell Regulator Co., Philadelphia 44. Operating data and specifications of approximately 100 measuring and control instruments and valves are outlined.

(32) ELIMINATING SEVERE SHOCK and vibration of hydraulically operated bucket loaders, power shovels, and other tracked or rubber-tired equipment is discussed in Bulletin 700 published by Greer Hydraulics, Inc., Brooklyn 15, N.Y. It covers operation of the Greer Hydropneumatic Accumulator, which is said to

# "Tycol Acylkup boosts bearing life... smooths the way for heavier loads"



Of course! Tycol Acylkup Bearing Grease "stays put"
... keeps anti-friction bearings running smooth and cool.
Finest quality neutral oils give it high load-carrying capacities.
Tycol Acylkup is firmly resistant to the washing action of water.

Its dependable lubricating abilities lengthen
bearing life and reduce maintenance costs.

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for further information.

# If you want peak production

### U-S-S COR-TEN

U-5-5 COR-TEN is a ductile, low-carbon chromiumnickel-silicon-copper-phosphorus steel having a minimum yield point, in thickness of ½" and under, of 50,000 psi-at least one and one-half times that of structural carbon steel.

It has a minimum tensile strength of 70,000 psi in these same thicknesses. Its resistance to abrasion, shock and impact is superior to structural carbon steel; its latigue resistance—that is, its ability to withstand vibration stresses, is 60% greater.

Withstand vibration stresses, it will be used to be use

to reduce weight.

U.S.S COR-TEN is produced in all standard products — plates, shapes, bars, sheets, strip, special cold formed sections, wire and tubular products. It is recommended particularly in light and intermediate thicknesses.

### U-S-S MAN-TEN

U.5.5 MAN-TEN is a grade of manganese-copper steel possessing formability, toughness and weldability in a higher degree than obtainable in carbon steel of the

same strength level.

U.3-5 MAN-TEN has the high yield point and high tensile strength of 50,000 pai and 75,000 psi, respectively, in thicknesses up to ½" inclusive. Its abrasion resistance is greater than that of structural carbon tension (ASTM A?); its fatigue strength is approximately steel (ASTM A?); its fatigue strength is approximately and reversal of stresses to which many types of equipment are subjected.

ment are subjected.

U.5.5 MAN-TEN is well suited for applications requiring high strength, toughness, workability and weldquality together with atmospheric corrosion resistance
equal or slightly better than that of copper steel. More
than 16 years of satisfactory service under the most
than 16 years of satisfactory service in suitability of
severe conditions have established the signale for
this grade for lightweight.

U-5-5 MAN-TEN is produced in plates, shapes, bars, sheets, strip, special cold formed sections and other products. It is particularly recommended for light and intermediate thicknesses.



### from your equipment

### Give it the stamina to stay on the job

### U-S-S TRI-TEN

This manganese-nickel-copper steel has a yield point of 50,000 pai min. and a tensile strength of 70,000 pai min. in thicknesses 1½" and under, with moderately lower values as thickness increases to a maximum of 4". It has superior toughness and ability to withstand shock at sub-zero temperatures. It has greater resistance to abrasion than structural earbon steel (ASTM A7) and its farting the resistance is 50% higher, U-S-S-TRI-TEN-S-resistance to atmospheric corrosion is slightly superior to copper steel.

Because U-5-5 TRI-TEN has very good welding properties in intermediate and heavier thicknesses, this grade is particularly recommended for application in heavy duty equipment, such as illustrated below, where maximum ruggéedness and strength with minimum weight are prime

requisites.

U-5-5 TRI-TIN is produced in plates, structural shapes, bars and bar shapes.

YOU can do it with U.S.S High Strength Steels.

Today the mining industry faces the biggest task in its history. To meet the nation's critical mineral requirements it must produce as never before.

Big-capacity, faster and more powerful equipment will help you meet this situation. But only if it is rugged enough to take a record amount of punishment, only if it can stand up in any kind of weather—day after day.

That's why it is so important to minimize, as far as possible, structural failures that can put costly, urgently needed equipment out of service. That's why it is vitally necessary to make sure that your drag lines, shovels, crawlers, 'dozers, trucks, mine cars, and other essential equipment are built as strong, as tough and as durable as possible.

You can do it with U.S.S High Strength Steels.

With high-strength U·S·S COR-TEN, U·S·S MAN-TEN and U·S·S TRI-TEN, equipment breakdowns that hamper operations and run up costs can be greatly reduced. With these famous "steels that do more" you can build maximum strength and toughness into vital parts ordinarily prone to failure. With them, high resistance to wear, fatigue, abrasion, atmospheric corrosion and shock can be incorporated where needed.

In addition, these U·S·S High Strength Steels—because they have a yield point 50% higher than ordinary structural steel—can be used to materially increase the strength of parts without increasing their weight. Or they can sometimes be used in lighter sections without in any way diminishing strength or stamina. In both cases, substantial savings in steel may result. This is important now, with steel in restricted supply.

Our engineers for 16 years have cooperated with the mining industry in applying U.S.S. High Strength Steels to equipment noted for its dependability, long life and low maintenance cost. They will be glad to show you how these tougher, stronger, more durable steels can be applied to give your equipment the stamina to stay on the job.

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### Just Off to Help



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fings. That's right, all the working data—dimensions, weights, safe loads, standard eye sizes, tuck lengths, sizes and data on standard and special fittings, straight pull, basket, choker and angle hitches, simplified ordering procedure, etc., on 12 factory fitted and factory packaged aling types. Also there is valuable information on sling care and on braided wire fabric for rigging your own slings.

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# NEWS Round-Up

### News Briefs and Trends

### Truman Asks Federal Power for Mines; Senate Hearing Starts

In a letter to Vice President Alben W. Barkley and House Speaker Sam Rayburn, President Truman Jan. 22 asked Congress to act on coal mine safety measures immediately. "Almost every measures immediately. day, miners are being killed needlessly, somewhere in this country," Mr. Truman said. "We have got to put a stop to it. The miners and their families are entitled to protection by their government. It is our plain duty to keep the coal mines just as safe as human skill and effort can make them." A special report from Secretary of the Interior Chapman on the Orient No. 2 disaster accompanying his letter "explains very clearly and concisely why we must have federal legislation to deal with the safety situa-tion in the coal mines," he commented. "Bills are now pending before the Congress to grant enforcement powers to the Interior Department," Mr. Truman also pointed out

Meanwhile, hearings on legislation to give federal inspectors power to close unsafe mines were scheduled to begin Jan. 24 before a Subcommittee of the Senate Labor and Public Welfare Committee headed by Sen. M. M. Neely of West Virginia. Other members of the Subcommittee are Senators Hill (Ala.). Humphrey (Minn.), Taft (Ohio) and Morse (Ore.). Earlier, on Jan. 18, John L. Lewis vigorously protested any delay in the hearings in a telegram to Sen. James E. Murray (Mont.), chairman of the full committee. Commenting on reports that industry representatives had asked for more time to prepare for the hearings, Mr. Lewis said: "They desire delay in order to give time for their lawyers to formulate a bill designed to minimize possible safety regulations enforceable by the Federal Bureau of Mines." Calling

it a "brutal and barbaric request," he said: "Assuredly, time is of the essence and any delay . . . by Congress may result in further unnecessary loss of life in the coal mines."

EDITOR'S NOTE – An industry-wide program designed for maximum safety achievement is proposed in the article between pp 100 and 101 of this issue. Comments and suggestions from EVERY READER will be sincerely welcomed by COAL AGE. You will NOT be quoted if you so indicate.

### Your Future . . . As the Fair Deal Sees It

"We do not believe the economic limit of taxation has been reached."—Report of the President's Council of Economic Advisers, Jan. 16, 1952.

#### **Jeffrey Continues With Colmol**

As a result of an amicable settlement, the suit of The Sunnyhill Coal Co. v The Jeffrey Mfg. Co., filed last May 23, has been dismissed and the parties have terminated their previous contract, it was reported Jan. 14. Jeffrey has received an exclusive license to manufacture and sell Colmols and Moleveyors in the United States. With this complete settlement, Jeffrey will continue its development, manufacture and sale of the two continuous-mining units.

#### UMWA Asks Safety Shutdown of 15 Independent Colorado Mines

In what an operator representative called "trying to use the state inspection department to do what they couldn't accomplish by force," officers of UMWA District 15 have demanded that the state close 15 independent mines in Freemont County, Colorado, and prosecute the owners for violation of minimum safety standards, it was reported Jan. 12. In the letter addressed directly to Tom Allen, head of the Colorado coal-mine inspection department, the UMWA officials said that federal inspectors had found 130 violations of the safety code

in the mines and that they were enter-ing the case "since there are no safety committeemen available to the workers W. D. Corley, operin these mines." ator of one of the larger mines cited, denied the charges of "flagrant" violations and pointed out that his and other mines had only recently been given a clean bill of health by state inspectors. He also emphasized that miners in his company and many others were represented by the Rocky Mountain Coal Miners Union and that the union had a functioning safety committee. Pointing to the fact that the violations referred to were "minor" and were of the federal code and not of the state law, Mr. Corley said "this looks like a reprisal by the UMWA against a field where they lost out because of their

### NCA Pledges State Support; Opposes Federal Mine Bill

Directors of the National Coal Association, meeting in Washington Jan. 22, adopted the following resolution:

"Whereas, coal mine operators represented in this association reaffirm their wholehearted desire for maximum mine safety and their deep concern with ways and means for coping with the hazards implicit in mining operations so as to minimize injuries and fatalities; and

"Whereas, their interest and their efforts are reflected in the continuing reduction in the number and severity of accidents in coal mines during the past 25 years and the great gains in safety, both below ground and above ground; a reduction in mine fatalities of more than two-thirds in these 25 years; a reduction in accidents per ton of coal produced of more than two-thirds; a reduction of accidents per man hour of exposure of more than 50 percent; and within recent years the record has shown a constant and steady improvement; and

"Whereas, it is the avowed purpose of our industry that such an outstanding record of attention shall be maintained and continued; and

"Whereas, this record has been achieved and should be continued under state control.

"Therefore, the directors of the National Coal Association, in meeting at Washington, D. C., January 22, 1952, pledge its continued support to further improvements in state mining laws in the interest of better safety practices and register its opposition to proposed legislation granting police power over coal mines to the federal government."

More News Briefs on p 158

#### Also in This Section

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New Preparation Facilities	P	146
Association Activities	p	148
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Among the Manufacturers	P	186
New Books for Coal Men	p	200

### For Better Wage Talks . . .

HARRY M. MOSES, president, Bituminous Coal Operators' Association, offered these guides for the conduct of coal wage talks as a part of an address before the Coal Mining Institute of America, at Pittsburgh, Dec. 12, 1951:

"Since we have had through the years a consistent pattern of approach and our own reactions have been equally consistently predictable, isn't it time in these days of battered morals and ethics for a great industry such as ours to meet our labor-management problems on some basis other than that of trickiness, chicanery and economic or political power? Isn't it time for us to be moving in the direction of setting up a shining example by a careful study of all the contributing factors, measured fairly from the side of ownership and the side of labor, leading to a joint conclusion which must obviously be the right thing to do?

"I have come to the conclusion that in our relationship with the UMWA through many years we have permitted a molehill to grow into a mountain. I do not believe that the public is interested in the coal-mining industry as such except when there is a shortage of our product in the country and at the time when the price of our product is being considered. In both these cases we should be—and are—considerably more interested than the public, because it is only good business for us to be able to provide a continuous supply of good product at the lowest possible price commensurate with good business practices.

"I believe that the government considers the coal industry in its present status as a necessary evil and when they are permitted to inject themselves in our affairs all matters that they handle are settled on the basis of expediency, usually political, and that there is no hope that laws and government can settle our problems as well as we can.

Therefore, I believe that pyrotechnical displays, semirevolutions and convulsions that run through the industry periodically . . . are most unnecessary; that if both sides of this potential controversy could and would agree that facts are facts . . . and if we could abandon our efforts to turn sharp corners, to create misinformation and to destroy the leadership on each side, a businesslike relationship, both unselfish and steadily productive of worthwhile result, would be attained. . .

"To do this, we must be realistic. We must avoid the tendency to play one group against another, avoid the appeal to selfish interests . . . Regardless of our basic differences . . . we should have a free interchange of information and an honest understanding of each group's problems.

"Looking down the road to the expiration of our contract, which has a possible fixed expiration date of March 31, 1952, conceivably this contract could be perpetuated by the simple device of either side failing to give notice of its desire to terminate. This is a most optimistic viewpoint but, nevertheless, it is a possibility that exists by the very character of the contract. The only other conception is that it might be reopened for a discussion of changes or betterments by either side. I have no predictions to make as to the outcome in such an eventuality. I do not know that our employees are unhappy with their present contract relationship and I have no present knowledge of any desire on their part for changes.

"It has been my observation that predictions on the part of the industry as to what the future in labor-management relations is to be get badly distorted, get widespread publicity, are sooner or later twisted into statements, and ultimately become demands.

"Therefore, since we have a labor contract with the minimum expiration date, let's keep on digging coal. Let's leave the dire predictions to Kiplinger and the other business services. Let's meet what we find down the road with open minds, with the same complacency that we meet other business problems of like importance.

"Let's permit the agencies you have created for this purpose to function properly or to fail, in the sure belief that these issues must be met on the basis of the facts as we find them in the coal business and not in any other business; that they cannot be met on the basis of the personal ambition of one individual to exceed another; that we continue the attempt to dignify this relationship into an everyday business relationship where confidence and understanding can and must promote peace and harmony."





#### COAL MEN ON THE JOB

SUNNYHILL COAL CO., NEW LEXINGTON, OHIO: H. G. Roy (left, top photo), engineer; P. L. Snyder, general manager; and R. N. Anderson, draftsman; and, in the Sunnyhill No. 8 plant (bottom), H. C. Bookman, chief electrician; G. A. Shiplet, plant operator; and C. A. Lehman, shift mechanic.



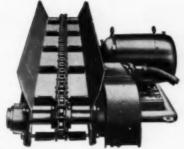
RED JACKET COAL CORP.: P. M. Farquharson (left), chief safety inspector; N. W. Long, resident engineer; and Claude Meade, section foreman, in the Coalburg mine.

NEW RIVER CO., STANAFORD NO. 2 MINE, MT. HOPE, W. VA.: T. W. Howard (left), engineer; M. H. Warden, mine foreman; and J. F. Colley, section foreman.



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C-60 Chain Parts Showing Double Lock on Chain Pin



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The Model FA is the last word in Chain Conveyors. It not only brings you the advantages of simple V-belt drive, more efficient speed reducer, 500 lbs. less weight, 4 sq. ft. less base area, and easy reversibility. In addition, three new Joy-engineered chains are available: the C-60 with malleable block links (19,000 lbs. ultimate strength); the C-60 fully heat-treated (25,000 lbs. strength); and the H-79 Promal heat-treated pintle-type chain,

which has an ultimate strength of 27,000 lbs.

All three chains have drop-forged flights integral with the link. The H-79 is also available with a detachable flight. Other superior features of FA Conveyors include an exclusive, non-jamming gravity take-up for the chain, and a ball-bearing mounted shear-pin sprocket which continues rotating and cannot damage either the head-shaft or the sprocket bore if the pin shears. • Write for Bulletin LD-200.

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### **Personal Notes**

Tim Hollandsworth has been elected president, Guyan Eagle Coal Co. Amberstdale, W. Va., and its subsidiaries, the Elk Creek Coal Co. and the Buffalo Chilton Coal Co. He succeeds his fatherin-law, John A. Kelly, who becomes chairman of the board. Mr. Hollandsworth, who was formerly secretary of Guyan Eagle, will also continue in his former post of president of the Kelly-Hatfield Land Co. Other Guyan Eagle officers elected were: John Davis, vice president and general manager: John Fields, vice president in charge of sales; and Gilmore Kelly, vice president and secretary.

Harold Pridham, who recently was named president of the Davis Coal & Coke Co., has been appointed president of the Davis-Clinchfield Export Coal Corp. Mr. Pridham formerly was vice president in charge of sales for Davis Coal & Coke and also was a vice president of Davis-Clinchfield Export.

Charles B. Tillson Jr., has been appointed assistant superintendent of the Crucible (Pa.) mine of the Crucible Steel Co., according to an announcement by G. E. Muns, manager of the fuel department. A mining engineering graduate of Lehigh University, Mr. Tillson has been associated with Bethlehem Mines Corp. for the past 14 yr.

Michael F. Farrell has been named assistant superintendent, Glen Lyon (Pa.) colliery, Susquehanna Collieries Div. of the M. A. Hanna Co., C. A. Gibbons, vice president and general manager of the division, recently announced. A Penn State mining engineering graduare, Mr. Farrell joined the company in 1938 and was formerly colliery engineer at Glen Lyon.

Ernest D. LeMay, for past 15 yr public relations director of the Tennessee Coal, Iron & R.R. Co., Birmingham, Ala., retired Jan. 1 after 40 yr of service with the company. John L. Mortimer, director of public relations for U. S. Steel in the Gulf-Southeast district, has succeded Mr. LeMay as Southeast district public relations director, with headquarters in Birmingham. Stephen T. McGinnis, \*assistant director of public relations for TCI, which on Jan. I became the Tennessee Coal & Iron Div. of the U. S. Steel Co., has been promoted to asso-ciate director of the Southeast district. A native of Alabama, Mr. LeMay joined TCI in 1911 as assistant in the coal mining engineering department and later was chief clerk of the operating department. From 1921 to 1930 he was secretary to the president of the company and then was assistant to the president until he was named director of public relations in 1937. Well-known in Birmingham, Mr. LeMay has been active in many of its civic affairs for some years. A former newspaperman and manager of the publicity department of the Houston Chamber of Commerce, Mr. Mortimer joined U. S. Steel in 1943 as director of public relations for the Southwest district.

Lee D. Siniff, mechanical and electrical engineer, Consolidation Coal Co. (Ky.), Div. of Pittsburgh Consolidation Coal Co., Jenkins, Ky., has been granted a year's leave of absence by his company to accept a mining position in Turkey following a request for his services through the ECA. Employed by the Eti Bank, Ankara, the capital city of Turkey, Mr. Siniff will supervise the selection. installation, operation and maintenance of mechanized mining machinery, rectifiers and complete underground DC systems in two mines about 150 mi west of Ankara. One of his principal duties will be to train Turkish personnel in the oper-



Walker in Truax-Traer Post

CHARLES E. WALKER has been named general manager of operations for the Eastern Div. of Truax-Traer Coal Co., with offices at Kayford, W. Va. A veteran of 32 yr in coal mining. Mr. Walker became a general mine foreman with the island Creek Coal Co. in 1928. He later held various official positions with the company and from 1948 until his resignation last year was general manager. Island Creek mines.

ation, maintenance and installation of the equipment. Mr. Siniff, his wife and three children were scheduled to fly to Istanbul last month but will retain their residence in Jenkins. A graduate of Ohio State University. Mr. Siniff has held his present post with Consol since 1946 and is well known for his activities with the Eastern Kentucky Electrical and Mechanical Institute. Kentucky Mining Institute and other state and national mining organizations.

More Personal Notes on p 154

### COAL MEN ON THE JOB





GEORGES CREEK COAL CO., HETZEL (W. VA.) MINES, LOGAN COUNTY: W. M. Dinges (left), general superintendent; and Mose Endicott, superintendent; J. E. Bivens, (seated, right photo), and Orville Henderson, section foremen; Dennie Cheek, outside track foreman; William Altizer, dispatcher; Hobart Crum, section foreman; Martin Boytek (standing), section foreman; Basil Hughes, mine foreman; John Crum, Donald B. Creek, Russell Vance, section foremen.

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### **CMIA** Looks to the Future



SAFETY CONTESTS—Stephen Williams (left), Ohio Division of Mines, (retired); E. R. Maize, National Coal Association; C. H. Maize, Pa. Dept. of Mines; A. D. Sisk, Ky. Dept. of Mines & Minerals; C. F. Davis, UMWA; and G. A. Shoemaker, Pittsburgh Consolidation Coal Co., retiring institute president.



DIESELS AND FANS—J. H. East Jr. (left), USBM, Denver, Colo.; M. A. Eilliott, USBM, Pittsburgh; Raymond Mancha, Joy Mfg. Co., Pittsburgh; and D. J. Keenan, Sterling Coal Co., Barnesboro, institute president-elect.



COAL OUTLOOK, HAULAGE SAFETY AND FIRE EQUIP-MENT— Joseph Pursglove Jr. (left), Pittsburgh Consolidation Coal Co.; W. J. Schuster, Hanna Coal Co.; G. D. Wyant, Republic Steel Corp.; and H. P. Greenwald, USBM.



ROOF-BOLTING-J. J. Snure (left), Rochester & Pittsburgh; Acel Garland, Island Creek; A. R. Hood, Duquesne Light Co.; A. R. Werft, United States Steel Co.; and J. V. McKenna, Pa. Dept. of Mines.

# .... Safer Mining ... Better Methods .. Brighter Prospects

AN EVALUATION of competitive firstaid and mine-rescue efforts, a survey of roof-bolting experience and results, projections of coal's future, a listing of ways to prevent haulage accidents, and technical presentations of the proper application of fans, diesel locomotives and firefighting equipment were among the major topics at the 65th annual meeting of the Coal Mining Institute of America, at Pittsburgh, Pa., December 13-14.

Speaking on the subject, "Labor Contracts in the Coal Industry," at the institute banquet Thursday evening, Harry M. Moses, president, Bituminous Coal Operators' Association, Washington, D.C., reviewed the history of contracts in some detail and concluded that a business-like relationship between operators and labor leaders is necessary if labor-management problems are to be met on some basis other than trickiness and the use of economic and political power.

At the Thursday morning business session, J. M. Lowe, secretary-treasurer, informed CMIA members in attendance that the institute has grown to a membership of 608.

Thursday morning speakers were: G. A. Shoemaker, vice president, Pittsburgh-Consolidation Coal Co., and retiring president of the institute; C. H. Maize, state mine inspector, Gray, Pa., who presented the paper prepared by Richard Maize, secretary, Pennsylvania Department of Mines, Harrisburg, Pa.; A. D. Sisk, chief, Kentucky Department of Mines and Minerals, Lexington, Ky.; Stephen Williams, former chief, Ohio Division of Mines, Columbus, O.; and E. R. Maize, director, safety division, National Coal Association, Washington, D. C. Mesurs. Maize, Sisk, Williams and Maize spoke on the value of mine-rescue and first-aid contests in accident preventifica.

While the coal industry faces the immediate problems of attracting invest-(Continued on page 202)

#### 1952 CMIA Officers

President—D. J. Keenan, general superintendent, Sterling Coal Co., Barnesboro, Pa.

Vice Presidents—H. P. Greenwald, regional director, USBM, Pittsburgh; J. J. Snure, production manager, Rochester & Pittsburgh Coal Co., Indiana, Pa.; and W. G. Stevenson, general manager of mines, Hillman Coal & Coke Co., Pittsburgh.

Secretary-Treasurer—J. M. Lowe, cost accountant, Hillman Coal & Coke Co., Pittsburgh.

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SEE the keystone shape of the strands? Notice how compactly they fit together? That's the answer. There is more steel and less fiber in HERCULES Flattened Strand than in any other wire rope construction of equal size. And if you specify wire rope core, you get still more strength—7½% more—in the same diameter. That extra strength is often mighty useful—safer, too.

SEE how smoothly it fits the sheaves? Not one—but four wires in each strand touch the groove. That gives longer life to the rope... longer life to the sheave, too, because Flattened Strand's smooth outer surface prevents corrugation. And it's Preformed for easy handling.

The Red Strand is always your assurance of wire rope made of the finest steel and to the highest standards LESCHEN has developed in 95 years of rope making.

### HERCULES RED STRAND

"Wire Rope Handbook"
tells why, and where Flattened Strand
can best fit into your particular operation. Write for Booklet T-2.





### LESCHEN WIRE ROPE

Consult our Engine pring Department for specific recommendations. A. LESCHEN & SONS ROPE CO., 5909 Keennerly Ave., St. Louis 12, Misseouri. Distributors in all principal cities.

### Here's Proof: PROX Engineering Helps You

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### NO BULKY HEADS

Properly designed heads reduce drag, help eliminate breakage during cutting operations.

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This durable, strapless design prevents floating and whippage of the chain . . . adds years to its cutting life.

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High stress values found in finer alloy steel is a designed-into factor of Prox Duomatic Chains.

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Interchangeability of parts machined to exacting specifications means quick onthe-job repairs...less down time.

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Greater strength from hardened forging means added dependability under hardest cutting conditions.

### DUOMATIC CUTTER CHAINS and BITS

machined to exact specifications for best results on modern equipment

First! Prox engineered coal cutting chains and bits are specifically designed for the toughest underground operating conditions. Second! Prox chains and bits permit quick, low-cost repairs through on-the-job part replacements. Two big reasons why America's largest coal-producing mines use Prox chains.



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ARGE BITS



### New Mine Developments

### Pittsburgh Consol, Steel Firms Join in Coal Mine Operation

Three large coal consumers-National Steel Corp., Steel Company of Canada, Ltd., and Youngstown Sheet & Tube Co. -have joined with Pittsburgh Consoli-dation Coal Co. to form the Mathies Coal Co., it was announced Dec. 21 by George H. Love, president of Pittsburgh

The steel companies' participation is designed to increase their reserves of metallurgical coal and to avoid the present high capital costs of developing new mining operations to meet their increased coal needs. With respect to Pittsburgh Consolidation, Mr. Love pointed out that this transaction was in line with his company's announced intention to make continuing long-term arrangements with some of its major customers. The same sort of joint arrangement is very common in iron-ore operations and is a natural evolution in coal mining as the industry becomes more highly mechanized, involving greatly increased capital costs, Mr. Love said.

The new company, in which Pittsburgh Consol will have a one-third interest. will have a capitalization of \$9,000,000 in capital stock and a debt of \$9,000,000. all the funds being provided preportion-

ately by the stockholders. The Mathies Coal Co. will purchase Pittsburgh Consol's Mathies mine, which is on the Monongahela River and the Pennsylvania R.R. approximately 18 mi south of Pittsburgh. addition to the mine itself, which includes a modern cleaning and preparation plant and river-loading facilities the new company will acquire all the mining equipment, 600 acres of surface lands and some 30 million tons of Pittsburgh-seam metallurgical coal, all from Pittsburgh Consol.

For the two-thirds interest in the operation and reserves which it is relinquishing, Pittsburgh Consol will receive \$13,000,000, a part of which will be payable over the next 15 yr. In addition to reserves which Mathies Coal Co. will own in fee, it will also lease certain coal lands from Pittsburgh Consol.

The Pittsburgh Coal Co. will continue to supervise the operations of the property for Mathies Coal Co. The principal officers of the new company will be: G. A. Shoemaker, president; D. H. Davis, vice president; G. W. Kratz, secretary; and H. K. Yontz, treasurer.

Due to the expansion programs in the steel industry and the corresponding need for additional metallurgical coal, it is planned to increase the production at the mine during the next few years to take care of the coal requirements of the present customers of Pittsburgh Consol as well as the needs of these particular steel companies, Mr. Love reported.



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2. The patented Flashwelding process for attaching cable to terminal prevents oxidation at welded intersection and increases con-

3. Immediate delivery of MESCO-WELD Rail Bonds helps you avoid costly shutdowns.

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### Compass to Begin Deep Mining

Plans of the Compass Coal Co., Philippi, Barbour County, W. Va., to begin deep mining within several weeks were announced last month by Stephen Canonico, president of the company, which is a subsidiary of the Clinchfield Coal Corp. Initially, some 50 men will be employed, but present plans call for an eventual output of 2,000 tpd from the 7-ft Pittsburgh seam. Joseph Mathews is general foreman and Paul Stewart is maintenance superintendent. The company is presently producing some 4,000 tpd from stripping and also has been carrying on auger mining in recent months. Following development of the new deep mine, production from strip, deep and auger mining is expected to run about 8,000 tpd, it is reported.

#### Bethlehem Buys W. Va. Mine

Purchase of the Indian Coal Co. by the Bethlehem Mines Corp., subsidiary of the Bethlehem Steel Corp., was reported last month. The company operates the Volga No. 1 mine, Volga, Barbour County, W. Va., mining the Redstone seam. It produced 178,295 tons in 1950 and has a capacity of 45,000 tons monthly. It is Bethlehem Mines' second recent purchase in the area. Last year it acquired the Maryland Century Coal Co., operating at Century, Barbour County, W. Va.

## stripping the cost on coal stripping jobs

The I-R QUARRYMASTER speeds up primary blast-hole drilling and cuts costs all along the line.

High drilling speed, low bit cost, minimum labor requirements, low service truck charges—these are but a few Quarrymaster advantages that save time and money preparing overburden. Fast drilling speeds mean large production, permitting closer hole spacing for ideal fragmentation and efficient shovel or dragline operation. Compare the following features with any other drill rig.

- DRILL ANY KIND OF OVERBURDEN-from the softest shale to the hardest granite or conglomerates.
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Ask your nearest Ingersoll-Rand representative about this completely self-contained, self-propelled outfit that drills 6-inch holes, has continuous hole cleaning, automatic rotation and is available in either diesel or electric drive.



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Delmont Gas Coal Co. has transferred its coal mining property at Delmont, Pa., to Albert V. Eisaman, operating as the Loyal-Hanna Fuel Co., according to an announcement by Thomas G. Delmont president.

The former Dering mine of the Con-sumers Co., Eldorado, Ill., was re-opened early last month by the newly organized Eldorado Coal Co., a co-operative financed by employees. Closed since last April, the mine is being operated under lease from the Woosley Equipment Co., which recently acquired the property (Coal Age, January, p. 150) and is salvaging equipment not required for the present operation. Businessmen in Eldorado reportedly have contributed \$5,368 to assist in getting the mine reopened and miners, members of PMWA Local 117, were required to purchase \$100 worth of stock. The company will be run by a board of five men and is reported to have reserves for 20 yr of operation. About 100 men were employed initially, but it is expected that the property will eventually provide work for 250 to 300.

Formation of the Ravenwood Coal Co., Dola, W. Va., and its purchase of the Asheraft tipple was reported last month. The company will mine the Pittsburgh seam and present plans call for an output of 600 tpd, with reserves providing some 15 yr of operation at that rate. The tipple will be modernized, including the addition of vibrating screens to provide three sizes, and will be known as the Ravenwood tipple. David Sidford is president of the new firm. Bernard Reeves, manager of the mine, is vice president, and Charles F. Brown is treasurer. Sidford & Greene, New York, are exclusive sales agents.

### **Preparation Facilities**

Peters Creek Coal Co., Summersville, W. Va.-Contract closed with Roberts & Schaefer Co. for R&S Super-Airflow coal cleaners to clean 50 tph of 4x0.

Coal Div., Eastern Gas & Fuel Associates, Keystone, W. Va.-Contract closed with Roberts & Schaefer Co. for complete fine-coal preparation plant, with all conveying machinery, dedusting equipment and Pangborn dust collectors; capacity, 220 tph of 1/4x0.

Jamison Coal & Coke Co., No. 9 mine, Farmington, W. Va.-Contract closed with Peterson Filters & Engineering Co. for four 6x10 Peterson TFR filters for dewatering 14-mesh by 0 at new washery to be erected; filter capacity, 90 tph.

Woodward Iron Co., Woodward, Ala.-Contract closed with Peterson Filters & Engineering Co. for one Peterson 6x10 TFR filter to dewater 22 tph of 14-mesh

Olga Coal Co., Olga No. 2 mine, Coalwood, W. Va. - Contract closed with Nelson L. Davis Co. for design and equipping of 1,250-tph coal-cleaning using the dense-media process; R-O-M from mine hoist to be fed to a Wilmot Stocks Larger Choice of Chain Sizes

and Types of Attachments



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#### COMING MEETINGS

First International Conference on the Underground Gasification of Coal: sponsored jointly by the USBM and the Alabama Power Co., Feb. 12-14 (postponed from Jan. 28-30), Birningham and Gorges, Ala.

AIME: annual meeting, Feb. 18-21, Hotel Statler, New York.

Bituminous Coal Research, Inc.: annual meeting, Feb. 28, Edgewater Beach Hotel, Chicago.

American Power Conference: sponsored by Illinois Institute of Technology, first annual meeting of group formerly known as Midwest Power Conference, March 26-27, Sherman Hotel, Chicago.

American Society of Lubrication Engineers: 7th annual meeting and lubrication show, April 7-9, Hotel Statler, Cleveland.

American Mining Congress: 1952 Coal Convention, May 5-7, Netherlands Plaza Hotel, Cincinnati, Ohio,

Tenth Annual Anthracite Conference: May 8-9, Lehigh University, Bethlehem, Pa.

Southern Appalachian Industrial Exhibit: May 14-16, Bluefield, W. Va.

shaker screen scalping off plus 8-in material to be hand-picked; plus 8-in rock to be crushed and transported to refuse bin for final disposal to refuse dump by aerial-tramway system; crushed 8x0-in raw coal to be delivered to 4,000-tons-capacity blending bin from which coal will pass over group of presizing screens removing minus 1/4 in., which will be used for metallurgical purposes; 8x1/4 to be cleaned at 1.50 sp gr in three Neldco dense-media proces sors; including facilities for disposal of washery rejects and dust-collection facilities installed at all stations where raw coal is handled; final clean coal to be screened and boom-loaded to cars with five individual coal sizes, with a sixth track provided for loading 1/4x0; water tanks to be installed to receive plus 1/4-in coal to remove tramp wood; plant planned for two-shift operation, with 4,000-ton bin absorbing output from third mine shift.

#### **Association Activities**

Illinois Coal Operators' Association, at its annual meeting in Chicago Dec. 18. elected the following members of the executive board: D. W. Buchanan. George B. Harrington, F. F. Kolbe, T George B. Harrington, F. F. Kolle, C. Mullins, Stuyvesant Peabody, Jr., A. H. Truax, William P. Young and C. W. Peterson, treasurer. Officers elected by the executive board were: president, H. A. Treadwell; secretary, Fred S. Wilkey; and general counsel, Thurlow G. Essington.

Harlan (Ky.) Mining Institute has elected new officers, as follows: presi-

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You'll get longer service life from wire rope if you do. Here are some points to keep in mind when you're selecting wire rope for any equipment...

### STRENGTH

Don't send a boy to do a man's job. Make sure the wire rope you order has enough strength to take care of the maximum load—plus a necessary safety factor.

### FLEXIBILITY

If your ropes undergo repeated bending over small sheaves, you'll need a flexible rope with maximum resistance to bending fatigue. Two things increase flexibility—smaller wires and preforming.

### 3 mile

### **ABRASION RESISTANCE**

Lang lay ropes, when properly installed, and constructions with large outer wires will help extend the service life of drag lines and other wire ropes that are subject to severe abrasive wear.

### RESISTANCE TO CRUSHING



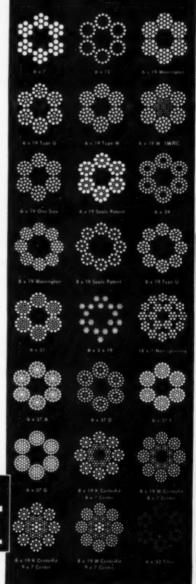
An independent wire rope center gives outside strands the support necessary to withstand crushing and distortion—large outer wires help spread the load over a greater area.

When you're looking for ways to cut operating costs, why not enlist the help of your nearest J&L Wire Rope representative? He'll help you select the right balance of these wire rope properties o get the longest service life on your specific type

of equipment and operating condition.

Through years of research and actual operation in the field, J&L has developed a complete line of wire rope sizes and constructions. You'll find it profitable to cash in NOW on J&L experience and manufacturing know-how.

### Select a Wire Rope that Fits Your Equipment Needs





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# All TREASURE is n't buried in Sand!

Millions of tons of marketable coal are lying on top of the ground already mined in vast slurry ponds. The C-M-I Continuous Centrifugal Dryer can help you to turn this treasure into salable coal.

The C-M-I Centrifugal Dryer is the efficient, profitable and economical answer to all of your dewatering problems.

Reduces Water Content. The C.M.-I Dryer reduces the surface maisture of newly washed coal. It takes off the greatest volume of water thereby reducing the cost of heat drying, the mare expensive method.

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### Check List for the C.M.I DRYER

Efficient—The C-M-I Dryer will reduce the water content of 28 tons of slurry from 82% to 7 ½ % in less than one hour!

Profitable—Figures submitted by operators using the C-M-I Dryer show that in slurry salvage alone, the extra profits will pay for the equipment

Capacity—The large C-M-I Dryer will handle as much as 75 tons of %" x 28 mesh coal per hour, reducing the water content from 25% of surface moisture to 6% or less.

**Durable**—All parts are made of the best metals obtainable. Revolving parts are dynamically balanced on the latest type of balancing machine.

Economical—In many instances, the C-M-I Dryer eliminates costly heat drying normally required.

YES NO

YES NO

YES NO

YES NO

YES NO



in a few months time.

If you are interested in how your dewatering problems may be solved with a C-M-I Dryer, write to us, stating the sizing of the coal, such as the percentage on 8 mesh, 10 mesh, 20 mesh, 35 mesh, 65 mesh and 100 mesh standard Tyler screens, and also the amount passing through 100 mesh. We will make our recommendation at no cost to you

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#### **EQUIPMENT APPROVALS**

Five approvals of permissible equipment were issued by the U. S. Bureau of Mines in December, as follows:

Joy Mfg. Co.—Distribution box; 500 v, AC; Approval 2-826A; Dec. 4.

Long Super Mine Car Co., Inc.— Type 15-hp AC conveyor power unit; one 15-hp motor 440 v, AC; approval 2-827A; Dec. 4.

Goodman Mfg. Co.—Type 99-5GT-30 belt conveyor; one 50-hp motor, 440 v, AC; Approval 2-828A; Dec. 13.

Joy Mfg. Co.—Type 88U-13LE loading machine; one 15-hp motor, 250 v, DC; Approval 8-829; Dec. 19. Ensign Electric & Mfg. Co.—Type L distribution box; 250 and 550 v. DC; Approvals 2-830 and 2-830A; Dec. 20.

dent, Lawrence Bassham, Harlan Wallins Coal Co.; vice presidents, B. W. Whitfield, Harlan Collieries Co., and E. K. Newman, International Harvester Co.; secretary, E. A. Starling, Harlan County Coal Operators' Association; and treasurer, C. W. Denham, Denham Engineering Co. Board members are: A. J. Mecarty, W. R. Lint, William Palmer, Henry Shackleford, C. P. McClung, Jack Mabellini, E. E. Eagle and Ed Taylor.

Richard T. Todhunter, Jr., general manager, Barnes & Tucker Co., Barnesboro, Pa., has been named to a third consecutive term as president of the North Cambria Council of the Joseph A. Holmes Safety Association.

Kanawha Valley Mining Institute has elected new officers as follows: president, Rush Meadows: vice presidents, J. A. Willis, Jr., W. B. Devaney and H. A. Jones; executive vice president, Charles L. Milligan; secretary, L. B. Studer; assistant secretary, A. W. Fluegel; treasurer, William Buchanan; and assistant treasurer, Roy S. Long. Elected directors of the Institute were: M. L. Alley, Carl Anderson, W. J. Bottomlee, Ed Breit, William Buchanan, George Buckley, F. E. Burger, E. M. Cassidy, A. L. Clark, W. B. Devaney, E. H. Eckhart, A. V. Faull, James Gilchrist, W. T. Hawkes, G. D. Holmes, C. V. Hunt, H. A. Jones, W. W. Hunter, C. J. Kirby, R. S. Long, L. K. Marmet, W. L. Martin, Rush Meadows, H. W. Moore, L. M. Morris, Quin Morton III, Joe Mulligan, W. R. Perfater, Wayne Plymale Jr., W. Sharpenberg, J. F. Steele, E. E. Stephens, O. G. Stewart, Roger Tompkins, J. A. Willis Jr., R. F. Willis, W. F. Wolfe, R. R. Woodrum and G. M. Yeager.

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Applied by pressure, as illustrated in the circle above, PERMATREAT coats every particle of coal as it leaves the chutes. In this installation, oil is heated to about 175 de-

grees. This allows it to atomize into a fine mist, reducing the amount required for thorough dust-proofing.

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is going into the work lines and less into friction drag on the machinery. And there's further big benefits from reduced maintenance . . . less frequent lubrica-

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### PERSONAL NOTES . . . Cont'd

Louis LaSalle, general superintendent for the Colony Coal Co., at Rock Springs, Wyo., has been named manager of operations for that firm and for the Colorado & Utah Coal Co., Mt. Harris, Colo., W. J. Thompson of Denver, president of the two companies, announced last month. Ralph P. Hogan, chief engineer for Colony, will direct engineering for the two companies.

H. A. Howard has been elected president of the newly incorporated Coleman Collieries. Ltd., formed to operate three coal mining companies in the Alberta sector of Crow's Nest Pass. The companies whose assets have been taken over by the new organization are the International Coal & Coke Co. and McGillivray Creek Coal & Coke Co., Coleman, Alta., and the Hillcrest-Mohawk Collieries, Bellevue, Alta. Mr. Howard, a resident of Calgary, formerly was president of International and McGillivray Creek. Other officers of the new company are: vice president, R. G. Anderson; managing director, F. J. Harquail, formerly with Hillcrest-Mohawk; general manager, H. W. Clarke, formerly general superintendent of Crow's Nest Pass Coal &c Coke Co.; general superintendent, Henry Millar; and secretary, Percy Dickinson, formerly secretary of International Coal & Coke. J. J. McIntyre, formerly general manager of the International McGillivray companies, has retired but has not announced his future plans.

Edward G. Fox, president of the Philadelphia & Reading Coal & Iron Co., has been elected chairman of the Anthracite Operators' Wage Agreement Committee, succeeding the late Edward Griffith, president of Glen Alden Coal Co.

Eric H. Reichl, research manager, Research and Development Div., Pittsburgh Consolidation Coal Co., left for Europe Jan. 15 to spend 2 mo in meetings with research people in Great Britain, Germany, France, Belgium and Holland, his third technical mission to Europe since 1944. Mr. Reichl will observe developments in coal processing, production of high-Btu gas directly from coal and making of synthetic-liquid fuels, and will also study new processes for dewatering and drying fine coal, not only for their application to coal-cleaning plants but as terminal equipment for coal pipe lines. The appointment of Wm. F. Saalbach as advisor on personnel and employment for Pittsburgh Consol's Research and Development Div. was announced Jan. 18. Mr. Saalbach formerly was acting director of placement and veteran affairs at the University of Pittsburgh and in recent years he has also done extensive graduate work in technical and business subjects and served as a lecturer in metallurgical engineering. Among his duties with Pittsburgh Consol will be the visiting of universities and graduate schools in the search of technical talent.

Paul T. Allsman, chief of the mining division of the USBM Region IV,

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MARION 191-M 10 cubic yards



Loads trucks in the 50-ton class in 3 or 4 passes to meet big haulage problems.

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Greater travel speed and maneuverability than most of smaller machines.

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A 10 cu. yd. heavy-duty shovel with small-machine cycle time.

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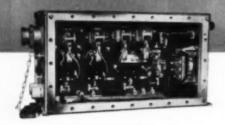


Bulletin 1100 Centrifugal Switch provides interlock for sequence operation of multiple belt conveyors. Provides belt protection against demage due to slippage when used with a Time Delay Relay. Available in A. C. or D. C. current.

### GREATER SAFETY



Bulletin 1125 ENSIGNEER Safety Balt Conveyor Control for stopping and starting conveyor from any point along belt-line by pressing together two bare wires. Two dry cells provide 11/2 volts to the bere wire. Available with all accessories such as Insulators, Insulator Brackets with bolts, Tension Springs, etc.



Bulletin 5392 — 20-30 HP 230 v. D. C. ENSIGN-CLARK starter, Bureau of Mines explosion-tested enclosure. Reversing, with reverse switch interlocked. Heavy duty, with three points of acceleration for smooth sterting.

Type KK-G, 3-circuit ENSIGN Permissible Distribution Box, 250 v. with shunt trip and ground current limiter — with ENSIGN lever-action pluga — suitable for cutting machine, loading machine and drill. Use standard mining machine cable

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#### CONVEYOR BELT RENEWED EVERY 3 WEEKS\_NOW IN 7TH MONTH -FASTENED BY

RESCENT BELT FASTENERS

For all flat belting; conveyor, transmission, and elevator. Full holt strength for full life of half. He metal



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7 MOS. Denver, for the past 2 yr, last month was appointed regional director of the Bureau's Region V, with headquarters in Minneapolis, Minn. Mr. Allsman succeeded Paul Zinner, whose appointment as chief of the Minerals Div. in Washington, replacing Lowell B. Moon, resigned. was announced at the same time. A gradnate of the University of Arizona, Mr. Allsman joined the Bureau in 1936 fol lowing 12 vr in private mining and chem ical organizations.

#### **Obituaries**

George H. Jones, 59, vice president and general manager, Stevens Coal Co., Wilkes-Barre, Pa., died Jan. 17 in Geisinger Memorial Hospital, Danville. Mr. Jones, who had been in failing health for some time, was widely known throughout the anthracite region and was a member of the board of directors of the Anthracite Institute.

Robert L. Stallings, 61, president of the Georges Creek Coal Co., Cumberland, Md., died Dec. 22 near Mt. Storm, W. while enroute to visit his son in Charleston for the holidays. Mr. Stallings, who also was a director of the Liberty Trust Co. in Cumberland, began work at an early age for the Davis Coal & Coke Co., shortly afterwards becoming associated with Georges Creek, which has properties in Maryland and West

George C. Rowland, 77, reported to be the first strip-mine operator in Indiana, died Dec. 19 in Chicago. A former civil engineer, Mr. Rowland operated a strip mine near Patricksburg from 1908 to 1936 and was a past-president of the Indiana Strip Coal Mine Operators' Association. During the past 15 pr of semi-retirement Mr. Rowland handled land purchasing for several firms.

#### **U. S. Mining Engineer Trying** To Cut Belgian Mining Costs

Neil Robinson, consulting mining engineer, Charleston, W. Va., "is engaged in a challenging attempt to increase production and lower costs in one of Belgium's poorest coal fields-an effort that may have a profound effect on the entire European drive to raise productivity and on Belgian participation in the Schuman a front-page article in the New York Times reported Dec. 28. According to the dispatch from Paris, Mr. Robinson asserted in a report to the ECA last year that Belgian mining costs were at least 20% too high and, when Belgian officials took exception, offered to prove his point. Since September, he has been under contract as a consultant to an independent mine owner in full charge of operations of one of the oldest, deepest and thinnest-seamed mines in the Liege area and his efforts to apply American management methods and know-how has attracted the close attention of Marshall Plan officials and of coal executives on the entire Continent.



TOHNSONITE has found a natural use in mines for a lot of reasons, but its easy installation is one BIG reason why it is being used so extensively.

Flexibility of Johnsonite Plastic Pipe enables it to find its own floor. eliminating cleanup work necessary on mining jobs.

Just feed it down in, and attach it to the pump or pipeline with an adapter having standard pipe threads. The other end of the adapter is an inner sleeve which slips into the pipe.

Stainless steel clamps tighten the pipe down over the sleeve.

It's easy to install also because of its light weight . . . 500 feet of Johnsonite in the ½" size weighs only 50 pounds.

Installation costs are lower than rigid pipe lines.

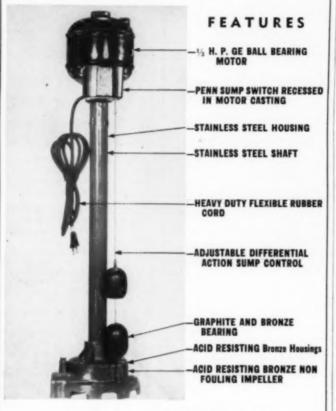
Johnsonite Plastic Pipe has other features worth looking into: acid and corrosion resistance; economy; 11/2 times less friction loss . . . . . . our new catalog will give you complete details.

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#### EMGLO SUMP PUMP

All Bronze and Stainless Steel Construction for Pumping Acid or Mine Water



#### ALL MODELS . . . IMMEDIATE DELIVERY

MODEL	VOLTAGE	PRICE - FOB FACTORY \$72	
P101	110 volt 60 cyc. 1 ph. AC		
P102	220 volt 60 cyc. 1 ph. AC	\$76	
P103	250 volt DC	\$135	

ASK YOUR LOCAL DEALER OR WRITE

#### EMGLO PUMP

80 MESSENGER ST.

JOHNSTOWN, PA.

DEALER INQUIRIES INVITED

#### News Briefs From p 135

#### TCI Pays Employee \$10,000 For Conveyor-Moving Idea

Probably one of the largest employeesuggestion awards ever made by any industry was presented by the Tennessee Coal & Iron Div., U. S. Steel, to Marvin E. Brown, section foreman at its Docena coal mine, shortly before Christmas. The \$10,000 was presented by TCI President A. V. Weibel as a reward for Mr. Brown's suggestion for moving conveyor equipment. According to reports, the idea permits advancing the conveyor with the working face without removing props and with only minor shifting of equip-ment. It saves two-thirds of the time formerly required and at the same time substantially increases output per shift. The method is being installed in every section and total cost per unit is said to be only \$6.50.

#### Searching Men Underground Ruled Legal in Kentucky

Under the Kentucky mining law, coal companies have the right to search their men in the interests of safety while they are working in a mine, Assistant Attorney General H. D. Reed Jr. ruled Dec. 18. The opinion was sent to Consolidation Coal Co. (Ky.), where searching miners underground to prevent smoking had previously resulted in several days of on-and-off strikes. The company had discharged five men but later rehired them after an agreement to abide by no-smoking regulations.

#### Pennsylvania Law Okays Use of Diesel Locomotive

Operation of diesel machinery underground in Pennsylvania subject to conditions set up by the Secretary of Mines, was approved by an amendment to the mining law passed by the General Assembly of the state Dec. 21. Pointing out that internal combustion engines or motors are prohibited in any coal mine, the amendment said that "the Secretary of Mines may, if he is satisfied that it will not be injurious to the health of employees, authorize the use of diesel-powered machinery under such reasonable general or special rulings or regulations as he may from time to time promulgate." Before amendment, the Pennsylvania law was similar in this respect to that of West Virginia which, according to a ruling of the State Attorney General, prohibits use of the diesel locomotive underground in West Virginia.

#### Members Assessed \$2 Monthly To Swell UMWA Backlog

In a letter dated Dec. 26 to all members and officers, the three top UMWA officials announced a \$2 assessment payable during the months of January, February, and March, 1952, as voted by the union's International Executive Board Dec. 19. After briefly reviewing the union's



#### makes efficiency go up coal come down, when you use

Coal brought down in just the right size means faster loading and higher profits. It's this kind of good breakage you get with American Explosives—plus the dependability that gives you a good shot which goes off when you want it, where you want it.

American Explosives are available in a wide variety of densities and velocities from any one of several conveniently located magazines or plants...make your next order American.

Capable Field Engineers are Available at Your Call
High Explosives • Permissibles • Blasting Powder • Blasting Accessories



Sales Offices: Pittsburgh, Pa., Bluefield, W. Va., Scranton, Pa. Chicago, Ill., Pottsville, Pa., Maynord, Mass.



ion's progress during the past year, mentioning fines and law suits under the "vicious" Taft-Hartley Act and pointing to possible deflation when government spending is over, the letter states: "To meet forthcoming developments, the UMWA must plan for human and union defense. We must not only consolidate our gains, but we must do everything possible to safeguard the equities of our membership and to create additional insurance by erecting financial bulwarks to take care of any emergency that we may meet in the future, as affecting the welfare of our membership and the security of our Union . . . Without question, un-certainty and dangers lurk ahead. We cannot afford to take any chances with the future security and progress of our members and our Organization. We need only look down the long gun barrel of our history to determine what is in store.

#### Coal Companies Cited for Management Excellence

The Lehigh Coal & Navigation Co. and Pittsburgh Consolidation Coal Co. have been awarded Certificates of Management Excellence for the year 1951 by the American Institute of Management, New York. It was the first time that Lehigh Coal & Navigation had received the award. Pittsburgh Consol was on the list of "excellently managed" firms a year ago. In 1951, only 298 firms in the United States and Canada were considered eligible, based on ratings in 10 separate fields of management. The AIM is a non-profit foundation devoted to the study and improvement of corporate organization and management.

#### Sheridan-Wyoming Files \$7,400,000 Anti-Trust Suits

Damages of \$7,400,000 from Peter Kiewit & Sons, Inc., are being sought by the Sheridan-Wyoming Coal Co., Inc. in suits filed Jan. 5 in the Federal District Court, Cheyenne, Wyo. Asking \$5,550,000 in triple damages under the Sherman Anti-Trust Act, the action charges that the Big Horn Coal Co., a Kiewit subsidiary, conspired in restraint of trade to force Sheridan-Wyoming out of business by selling coal below cost, illegal pricing and other acts. In a separate suit for \$1,850,000 in damages. Sheridan-Wyoming charges Kiewit with violation of Wyoming laws. Some time ago, a somewhat similar action was filed in the Cheyenne court by Big Horn, naming Sheridan-Wyoming as defendant.

#### AG&E to Build World's Largest Electric-Generating Unit

The American Gas & Electric Co. will construct a 200,000-kw generating unit at its Tanners Creek plant in Southeastern Indiana. It is expected to be the largest in the world and is scheduled to begin operation in June, 1954. AG&E is one of the Nation's highest-capacity electric utilities. distributing in seven states, although it serves no city of more than 150,000 population. More than 90% of its output is from coal-powered plants. The company's expansion program through 1954 reportedly will add 1,600,000 kw at a cost of \$300 million.



#### Taking coal for a ride...easier

With more than 300 cars handling coal at this midwest mine, lubrication of the wheel bearings could have become a real headache. That's why mine operators switched to SUPERLA Mine Lubricant No. 4 as suggested by a Standard Oil lubrication specialist over four years ago.

Already used in main transmissions and gathering heads of the mine's Joy loaders, SUPERLA Mine Lubricant No. 4 proved superior to other greases for wheel bearing lubrication as well. Leakage from the bearing housings was eliminated and consumption reduced. Motor men reported lower power requirements. Oilers found SUPERLA Mine Lubricant easy to withdraw from the barrel. easy to dispense with hand-operated guns. The versatility of SUPERLA Mine Lubricant No. 4 has both simplified the problem of inventory and reduced overall lubrication costs.

**SUPERLA** Mine Lubricant No. 4

SUPERLA Mine Lubricant No. 4 has solved more than one problem in this mine. Chances are that it (or another SUPERLA Mine Lubricant) can do a similar job for you. There is a Standard Oil lubrication specialist located near your mine. For his help, call your local Standard Oil office today. Standard Oil Company (Indiana), 910 South Michigan Ave., Chicago 80, Illinois.

What's your problem?



J. A. Grieve, lubrication specialist at Standard Oil's Decatur office, helped this midwest mine use SUPERLA Mine Lubricant No. 4 to good advantage. He was close at hand, gave operators engineering service when they needed it.

There's a corps of Standard Oil lubrication specialists throughout the Midwest. You'll find one located near your mine. Through special training and a lot of practical experience, this man has gained a working knowledge of lubrication that can mean real savings for you. To obtain his services, simply contact the nearest Standard Oil office. Discuss with him the savings you can make with such outstanding products as:

STANOIL Industrial Oils—Here's of line of oils that provides clean operation of loader and crane h draulic units; supplies effective la brication in compressors, gear case and circulating systems. One or tw grades can replace a wide variet of special oils and lubricants.

CALUMET Viscous Lubricants - On open gears and wire ropes, these greases strongly resist washing and throw-off. Their superior wetting ability affords better coating of gears and better internal lubrication of wire rope.

STANDARD OIL COMPANY





#### -the kind that is mined on the B&O!"

Take a tip from executives who think in terms of fuel economy and dependability of supply. These men design their plants for the efficient coals mined in B&O territory.

These coals, available in wide variety for all needs, lend themselves to mechanized, lowcost mining. As they are located close to America's industrial heart, transportation costs are moderate. And because their sources are known and definite, they can be depended upon —even during wartime—for centuries to come.

Backing its faith in Bituminous, the B&O has made large capital investments in its properties. The result will be even more efficient service for the Bituminous industry and its customers.

#### Ask Our Man! BITUMINOUS COALS FOR EVERY PURPOSE

from modern mines like this-







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Constantlyoing things -better!

# They Always FIT-10-A-Timken



The easiest way to replace a Timken bearing is to call our office. A complete stock of Timken bearings, for a wide variety of equipment, is on hand at all times. Before you replace, look for us in your phone directory and for TIMKEN on each cup and cone.

Ask for your FREE copies of the "AFBDA Bearing Maintenance Report"!

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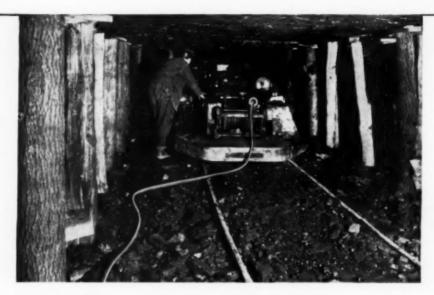
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One of the most important achievements of the research staff of the United States Rubber Company has been the development of an extremely tough Neoprene jacket compound. After carefully studying Mining Cable requirements, this Neoprene jacket has been applied to U. S. Royal Trailing Cable...making it one of the longest-wearing, most dependable cables available to the mining industry.

Use U. S. Royal where it will suffer the hardest wear. It is one cable actually too



tough for trouble. Rely on it for thorough safety. Depend upon U. S. Royal for uninterrupted power flow. For full information, write to address below.

#### U.S. Royal Cables EXCEED A.S.T.M. Requirements

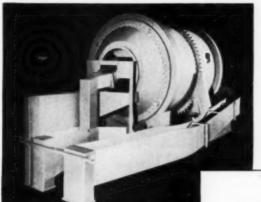
ORIGINAL	A.S.T.M. D752 Raquiroments (Minimo)	U.S. Neoprone Jacket Com- pound Typical Values
Tensile strength, lbs./sq. in Modulus @ 200% elongation,	1800	3600-3800
lbs. sq. in. Elongation, per cont (from 2") Set test, in inches. Toar test, lbs.	300 300 2% (Max.)	1000-1200 450- 550 21/6-21/6 80- 100
AGED 96 hours in exygen bomb @ 70C. Tonsile strength, lbs., sq. in Elongation, per cent (from 2")	1600 250	2800-3000 400- 450
AGED  168 hours in air oven @ 70C.  Tonsile strength, ths./sq. in  Elongation, per cont (from 2")	1600 250	2800-3000 400- 450
OIL TEST 18 hours in all @ 121C. Tensile strongth, lbs., sq. in Elongotion, per cent (from 2")	60	65- 70 65- 70



**U.S. ROYAL TRAILING CABLES** 

UNITED STATES RUBBER COMPANY
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#### **GET ADDED PROFIT**



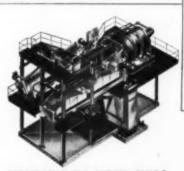
## ...from coal middlings THE WEMCO DOUBLE DRUM

is the only Heavy-Media Separator producing **three** products by **absolute**\* gravity control

Profitable washing of coal containing middlings to produce low ash coals at greatly increased yields can now be accomplished. Absolute gravity control of separation provided by WEMCO's new Double Drum Separator permits accurate segregation of bone and other middlings from **true float coal** and **true refuse.** This middling material is separated as a third product for recrushing or for sale as a low grade coal.

#### LOW CAPITAL INVESTMENT

The superior results of a two stage process are accomplished in **one** drum and **one** media reclamation circuit. There is no unnecessary duplication. Cost is a minimum.



#### **AVAILABLE IN MOBIL-MILLS**

For coal with middling material, WEMCO Double Drum Separators are furnished as the separatory vessels with WEMCO Mobil-Mills — the prefabricated HMS plants used by the majority of Heavy Media operators throughout the world.

For coal requiring less complex treatment, WEMCO MOBIL-MILLS are furnished with single compartment WEMCO Drum Separators or the efficient WEMCO Cone Separator, depending on the nature of the separation involved. Mobil-Mills are available in various sizes to treat up to 350 t.p.h.



#### A POSITIVE OPERATING PRINCIPLE

- True coal float is separated by a low gravity media in 1st compartment, while sink consisting of refuse and middlings passes to 2nd compartment.
- True sink and middlings are separated by a high gravity media in 2nd compartment.
- Both high and low gravity media remain uniform and constant in density in their respective drum compartments.
- Overflow of float material and lifting of sink are simple, effective actions.
- The entire separation is accomplished within one unit.

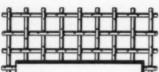
\* Absolute gravity control provides **positive** separation of the middling by the use of a homogeneous medium. This prevents the lower grades and recoveries common with the partly heterogeneous actions of other types of separating units.

Write today for complete information.



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Mobil-Mills - Coal Spirols - MMS Thickeners - HMS Pumps - Sand Pumps
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## K-P*Engineered*WIRE SCREENS

Korb-Pettit Wire Screens are not only first quality in material and workman-ship but are engineered for the job involved. Standard meshes, sizes and weights are stocked, made to specifications or febricated for any type of rotary or vibrating screen.

Due to high carbon content and special heat treatment, specify K-P Oil Tempered Spring Steel for the most abrasive screening operations.

Wire Screens
Hooked Edges
Spiral Woven Wire
Conveyor Belts,
Complete Special Purpose
Conveyor Systems
designed and
manufactured,
Wire Partitions,
Machine and Window
Guards, Cages,
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#### KORB-PETTIT WIRE FABRICS AND IRON WORKS

Engineers and Manufacturers 1503 N. Mascher St. Philadelphia 22, Pa.



#### COAL MEN

AT THE NEW BLUE-BONNET MINE of the Leavell Coal Co., Checotah, Okla.: George Arms (left), engineer, who designed and built the plant; and W. H. Burdett, superintendent.





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All your Oxyacetylene and Electric Arc Welding Supplies and Equipment

Wherever you're located, there's an authorized Airco dealer near you, able to supply you with a complete line of arc and oxyactylene equipment. He'll deliver oxygen, acetylene and other gases . . . calcium carbide . . . gas cutting or welding machines and supplies . . . arc welders, electrodes and accessories . . . direct to your door.

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# What to look for IN SELECTING A MODERN ELECTRIC CAP LAMP

One of a Series of informative advertisements on Better Light for the Miner

#### CONTINUOUS HIGH-LEVEL EFFICIENCY

You do not have to accept the penalty of dwindling efficiency and poor performance just to obtain long life.

The high-level efficiency of a WHEAT Lamp need never be impaired because its low initial cost permits battery replacement as needed, assuring continued new lamp performance.

#### NO BURNS FROM ELECTROLYTE

It is important to safeguard against burns from electrolyte.

No matter the position, electrolyte cannot escape from a WHEAT battery. Most of the electrolyte is absorbed by the plates and separators and only a fraction is free solution. This small amount is positively trapped by the spill-proof valve. There is no handling of renewal solution—the initial electrolyte in a WHEAT battery is never renewed.

#### **AUTOMATIC CHARGING**

The simplest method of charging requires the least attendance.

With the exclusive features of actual self-service and constant-potential charging, WHEAT Lamps are racked by your miners in less time than required to turn lamps in to an attendant. As each lamp is racked it goes on charge automatically, taking only enough current to complete its charge —and it can be left for days without danger of overcharge, always fully charged and ready for immediate use. Charging is regulated automatically without manual attention on the part of the lampman.

#### NEARBY SERVICE

Investigate the service facilities at your call—where, and how much?

WHEAT Lamp service through "National Mine" is fast, experienced, always available. Our trained service representatives, strategically-located warehouses, and regularly-scheduled trucks take prompt care of your needs.



National Mine Service Company

Bankley W. Vo.

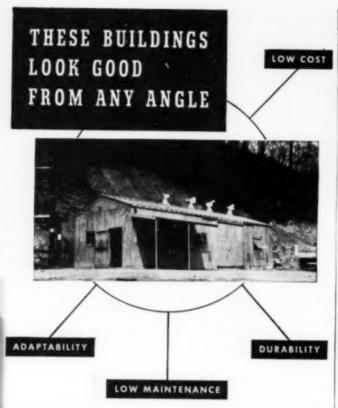
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WHITEMAN DIVISION

Has the Facilities—Delivers the Goods

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Experienced mining men have found that Armco STEELOX Structures help solve many of their most troublesome building problems. Here are a few reasons why:

STEELOX construction is so simple that an unskilled crew can put up a building in a matter of hours. Installed costs are low even in remote locations.

Durability and low maintenance are assured because STEELOX Buildings are sturdily constructed of 18-and 20-gage Armco ZINCGRIP-PAINTGRIP Steel. There isn't anything to warp, rot or get out of order. An occasional painting is generally the only maintenance required.

All-steel construction also means

that STEELOX structures are fire-resistant and lightning-safe when properly grounded. The patented STEELOX joint assures complete weathertightness. What's more, should conditions change these buildings can readily be re-arranged, extended with standard parts or moved to a new site without loss of material.

You will find Armco STEELOX Buildings ideal for head houses, repair shops, offices, converter stations and other mining needs. Write for complete information. Armco Drainage & Metal Products, Inc., 1442 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

#### ARMCO STEELOX BUILDINGS





Hanna Coal Official
To Aid Australian Mines

OTIS BLEDSOE, assistant general superintendent, strip mines, Hanna Coal Co., St. Clairsville, Ohio, left early last month for a 6-mo stay in Australia. Accompanied by Mrs. Bledsoe, he will make a special study of Australian coal resources and production methods in an attempt to increase the country's much needed output. Mr. Bledsoe's trip reportedly was made at the special request of the Prime Minister and was arranged for by the Australian Ambassador.

#### UMWA Sponsors New Bill for Mine Safety in Kentucky

A new mine-safety bill, sponsored by the UMWA, was ready for introduction in the Kentucky General Assembly, it was reported Jan. 14. A similar bill was defeated in the House in 1950 by a vote of 49 to 34. Among other things, the new measure provides for appointment of an adequate number of state mine inspectors to insure at least four inspections of all mines in the state a year. It calls for approval of applicants by an examining board and sets inspectors' term of office for a period of capable, efficient service and good behavior. Under its provisions, an accurate mine map must be made and posted on the surface at each mine and brought up to date by an official survey every 6 mo.

#### DSFA Sets New Deadlines for Construction Applications

CMP-4C application forms which are submitted to the Defense Solid Fuels Administration for the third calendar quarter of 1952 and subsequent quarters should be postmarked before midnight of the 15th day of the 4th month preceding the quarter for which delivery of the controlled materials is scheduled, the DSFA announced Jan. 21. For example, deliveries under the Controlled Materials Plan for the third quarter of 1952 should be mailed by March 15, 1952 and those for fourth quarter by June 15, 1952. Experience has indicated, the DSFA said.

# "FAIRMONT-BUILT"



## means a COAL CLEANING PLANT that is <u>GUARANTEED</u> MOST EFFICIENT

NEAR 100% EFFICIENCY

WIDE SIZE RANGE-16" TO 10"

LOWEST OPERATING COSTS

LEAST MAINTENANCE

Think of it, a coal preparation plant with a near-perfect score. Records from mine after mine show "Fairmont-Built" plants operating at 99%+ separating efficiency!

No wasted coal, no wasted operating expense with "Fairmont-Built" GUARANTEED plants which, over the years, show less down-time for maintenance and repairs. The well-engineered features of the Chance Sand Flotation System and the general excellence of plant construction GUARANTEE years of steady, economical, untroubled operation.

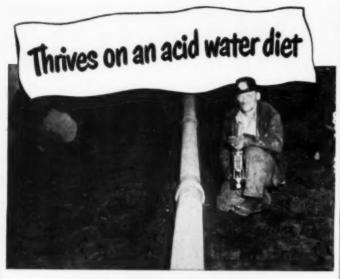
For help on your coal preparation problems, CALL THE FAIRMONT ENGINEERS.



Fairmont, West Virginia

Designers and Constructors of Chance Sand Flotation Process for Wet Cleaning and American Pneumatic Separator for Dry Cleaning

FAIRMONT-BUILT"



#### ...it's a TRANSITE PIPE mine drainage line!

A look at its service records would quickly tell you why we say Transite Mine Service Pipe "thrives on an acid water diet."

They show that in many installations, this corrosion-resistant asbestos-cement pipe has been carrying acid mine waters for periods as long as 10, 12 and 15 years with no replacements. In some cases, cor-

rosive conditions were so severe that ordinary pipe failed in months!

Transite Mine Service Pipe has other practical advantages, too. Tough and strong, it won't deform in use. Yet it is light in weight and easily installed. It is quickly coupled together, even in restricted mine passages - can be laid around curves without special fittings. Its tight joints stay tight in service.

Available for working pressures up to 150 lbs. per sq. in. and in a full range of diameters from 4" up, Transite is the money-saving pipe for practically any mine service requirement, including drainage lines, water supply lines, etc. For further information, write for Brochure TR-51A. Address Johns-Manville, Box 290, New York 16, N. Y.







Johns-Manville TRANSITEMEN

that earlier filing will assist it in substantiating its estimates of the requirements of the solid fuel industry for controlled materials at the time that allotments are determined by the DPA. The DSFA urged all producers to submit their applications as far in advance of the new deadlines as possible

#### **Pennsylvania Reclamation**

Operators in Pennsylvania planted 3,517 acres in trees and shrubs and 731 acres in grasses, according to a summary of reclamation of land affected by openpit mining during 1951 released last month by the state Department of Forest and Waters. Trees and shrubs planted by operators totaled 4.212.600. In the same period the Department of Forest and Waters planted 1,037,300 trees and shrubs, or a total of 864 acres.

#### Second-Quarter Allotments For Coal-Mine Construction

The Defense Solid Fuels Administration has been allotted 12,790 tons of steel, 259,000 lb of copper and 19,000 lb of aluminum by the DPA for coal-mine construction during the second quarter of 1952, it was reported last month. While the totals show increases over the first quarter, they still are not sufficient to meet the industry's needs, some industry representatives maintained.

#### 19 Nova Scotia Miners Killed

In what was reported to be Canada's worst mining disaster in 11 yr, 19 coal miners were killed Jan. 14 in the Mc-Gregor mine at Stellarton, Nova Scotia, reportedly as a result of a gas explosion occurring at the "very bottom of the bottom of the mine about 1% mi down the slope" from the pithead. Gas had been reported earlier in the day and the men killed and others had been working to seal off the danger area. Many miners had been pulled out of the mine before the explosion.

#### 18-Yr Communist Leadership Rejected by Australian Miners

MELBOURE (McGraw-Hill World News)-After 18 yr of experience with Communist leadership of their Australian Miners' Federation, miners have dealt Communism one of its greatest defeats in Australia in free elections to the Federation's Central Council, its governing With the removal of that leaderhody. ship, the Australian mining industry is expected to see the end of purely political strikes as well as increased production and more stable income and other benefits for miners. Two major reasons were reported for the change. First, miners were subjected to frequent abuse by other workers and the public because political strikes caused temporary unemployment in other industries as well as rationing of gas and electricity. Secondly, miners were said to feel that their Communist leaders were so busy with political action that they had little time to push justified industrial claims and in many cases were unwilling to proceed with them if they did not offer political possibilities. The 1951 coal production in Australia

#### THE NEN aughman; LOW INITIAL COST ECONOMICAL, UNIFORM and CONTROLLED LARGE-SCALE DRYING OPERATIONS Each unit designed for capacities ranging from 15 to 75 tons per hour, the Baughman "Verti-Vane" Thermal Dryer efficiently handles all coal sizes from 11/4" downreducing surface moisture to approximately 2% in a "one-pass" operation-delivering a uniformly dried and well-mixed product with practically no degradation. Multiple unit installations are recommended for large-scale drying operations. Simplicity of design, rugged construction, a minimum of moving parts, and slow operating speed tend to eliminate shift break-downs and keep replacement costs to a minimum. Controls are easily adjusted for various feed conditions so that operation of the unit requires very little attention. Outstanding in price performance, Baughman "Verti-Vane" Thermal Dryers give the best in high-quality drying operation with comparatively low initial cost. You are cordially invited to inspect Baughman Verti-Vane Dryer installations ... Robert Holmes' personnel will be pleased to escort you at your convenience. Write, wire or phone for details. WRITE FOR FREE **OPERATING** CATALOG FIOT COST TODAYI ROBT. HOLMES AND BROS., INC. DANVILLE, ILLINOIS



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27TH VICTAULIC YEAR



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#### COAL MEN ON THE JOB



WARNER COLLIERIES CO., Cadiz. Ohio: H. Thomas Douglas (left), personnel manager; and David T. Keyser. mining engineer.

was estimated at 24 million tons, the highest ever recorded but still 20% below the country's immediate needs. Before the war Australia produced 15,750,000 tons in 1938 to meet its own needs and export a surplus. A substantial increase in output for 1952 is being planned, government officials reported.

#### Amherst, Logan County Merge

Merger of the Amherst Coal Co. and the Logan County Coal Corp. and the change of name of the resulting firm to the Amherst Coal Co., effective, Jan. 21, has been announced by Herbert E. Jones, president. Business and properties of both the previous companies will be conducted and operated in the future under the name of the Amherst Coal Co., with offices at Lundale. W. Va.

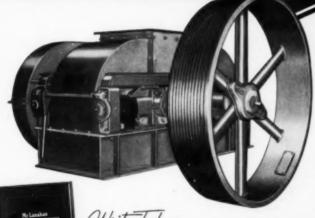
#### Illinois County Rule Limiting Stripping Stopped by Court

A zoning resolution of Knox County, Illinois, was held unconstitution by the Knox County Circuit Court in a decision dated Jan. 9 as far as it relates to regulations, restrictions or prohibitions of the use of land for the recovery of coal by stripping. In addition to the general opinion, Judge Fred G. Wolfe made the same findings and permanently and perpetually enjoined the county from enforcing or attempting to enforce the resolution in reference to property of the Midland Electric Coal Corp., which had asked the court for an injunction. The county had sought to prohibit coal stripping on 1,300 acres of land owned or leased by Midland Electric Coal Cowned to the court of the county had sought to prohibit coal stripping on 1,300 acres of land owned or leased by Midland Electric

#### 1,200 Virginia Miners Strike Against District Policies

Some 2,100 UMWA members in Southwest Virginia returned to work Jan. 11 after stoppages of almost a week at six mines in the area. According to reports, 1,200 of the men were protesting policies of District 28 officials appointed by national headquarters and were demanding that they be replaced by officers elected





for Bulletin

BD-457

Used extensively throughout the anthracite and bituminous coal fields, these dependable McLanahan Black Diamond Crushers crack large or small lumps of coal or other materials to desired size with a minimum of fines. These machines are the answer to your coal crushing problems, and are built to handle high tonnages. Available in numerous sizes and types, these single and double roll crushers are constructed of steel, semisteel, or fabricated steel, with babbitt or bronze bearings for a long life of satisfactory service.

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The "slip" of the hydraulic fluid at low rpm permits each motor to accelerate—independently—to working the design of the property of the couplings of the property of the

At Reeves, Flight No. 1 is driven by a 30 hp, 880 rpm, squirrel-cage motor through a 17.5° Twin Disc Coupling ... No. 2 and No. 3 flights each are powered with 25 hp, 1170 rpm, squirrel-cage motors driving through 14.5° Twin Disc Hydraulic Couplings ... and No. 4 with a 50 hp at 1170 rpm squirrel-cage motor, through a 21° Twin Disc Hydraulic Coupling. The entire system moves from 180 to 350 yards of gravel and topping per hour.

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by the district membership. The other 900 were said to be protesting grievances. The demonstration against the union was reportedly touched off by the firing of Charles Minton, UMWA field man, and included picketing of the district office in Norton by some 300 near who demanded an explanation of his dismissal. The men went back to work after completion of a 4-day hearing on their complaints held by two out-of-state members of the UMWA International Board. Results of the investigation were not made public.

#### **UMWA Auto Blasted in Kentucky**

An automobile owned by a UMWA organizer in Leslie County, Kentucky, was blown to bits Jan. 12 but no one was in the car at the time, Tom Rainey, UMWA International Board Member who is directing the organizing campaign in Clay and Leslie Counties, reported. It was the third car to be dynamited and the 17th dynamiting or machine-gunning in the area since the drive began, Mr. Rainey said. Earlier on Jan. 10, Federal Judge H. Church Ford, at Lexington, Ky., overruled a defense motion to dismiss the suit brought last fall by the UMWA against coal companies and law enforcement officers in the area charging that they had created a "reign of terror. Judge Ford set Feb. 4 for a hearing in Lexington on another defense motion that the case be transferred from the Jackson to London, Ky., Federal Court.

#### **Noteworthy in New Budget**

Among the items of particular interest to coal in the President Truman's budget message presented to Congress Jan. 21 were these recommendations:

Initiation of the St. Lawrence Seaway and Power Project.—"If there has ever been a water resource project with greater strategic benefits, it is the St. Lawrence project."

TVA additions—"\$63 million to begin installation of 11 additional steam-electric and hydroelectric generation units in the Tennessee Valley Authority . . . needed not only to meet the steady growth of the power needs of the area but also for the large increase in the requirements for the atomic energy facilities in this area.

Pacific Northwest Power—"In order to make it possible to meet defense power requirements in the Pacific Northwest, I also recommend legislation to authorize the construction, operation and maintenance of fuel-fired electric-generating plants. Such plants would provide an early increase in capacity and would make more effective use of existing hydroelectric facilities.

USBM and USGS appropriations—For the Bureau of Mines, an increase of \$4,-202,144 over the current year, to a total of \$27,615,000. For health and safety work, the current figure of \$3,790,000 would be boosted to \$4,080,000, and for conservation and development of mineral resources, \$18,657,000 was asked, as compared with the current \$16,858,603. For the U. S. Geological Survey, \$29,055,000 was proposed, an increase of \$7,605,000 over present appropriations.















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BACKS

of the Four Trackless Mining Units at LIDA B Mine

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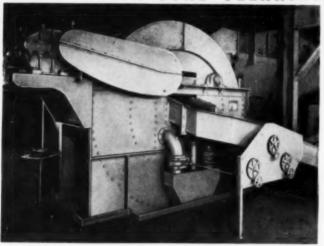
Only one 50 H. P. motor . . no differential.

Front head raises and lowers 26" above floor line and 18" below floor line.

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Whether you produce a small or large volume of coal we shall be glad to welcome the opportunity to tell you more about the NELDCO System of Heavy Media Coal Cleaning.



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#### Gasoline From U. S. Coal Not Far Off, Koppers Thinks

Chemicals are the key that will unlock the door to establishment of an American synthetic-liquid-fuels industry, and that door will be unlocked er than most people think, G. F. D'Alelio, research manager of the Koppers Co., Inc., declared Jan. 5. He announced that Koppers is forming a coordinated fuels processing section in its research department designed to accelerate the pace of Koppers research, not only in coal carbonization but to probe more deeply the gasification and hydrogenation of coal. While gasoline cannot be presently made from coal at competitive prices, research is finding ways to produce an increasing number of valuable chemicals in such processes, which can be regulated to produce more chemicals and less gasoline, he reported. "It is here that upgrading of products may result in a 'coal to gasoline' plant becoming economically feasible much sooner than many think," he said. Koppers currently is building a pilot plant to make gasoline from coal by the hydrogenation method at its new Research Center at Verona, Pa.

#### New BCI Booklet

The Genie Story, a booklet designed to tell the story of coal's utilizationthe part coal plays in our daily lives-in a form that will capture and hold the attention of both young and grownup readers, was released last month by Bituminous Coal Institute. Prepared in a cartoon style, the booklet will be "fascinating to every child in every school, to all adults who in millions now read 'comics', and to every teacher who should bless us for this helpful instructional unit, Dr. Speare, head of the BCI Educational Div. Quantity lots may be obtained at \$40 per thousand by coal companies who may wish to distribute them to employees or customers.

#### 1951 British Output Up; More Forecast in 1952

British coal production in 1951 was some 7,000,000 tons greater than 1950, with over half the increase a result of special production campaigns by the miners, the chairman of the National Coal Board reported Jan. 8. There is hope for an even greater increase in 1952, it was also reported. Britain's imports of coal may be held down to 600,000 tons during 1952, compared with 1,000,000 tons last year. and it may have more coal to export to other countries, it was said. Britain expects to get 500,000 tons of its imports from the U.S. An increase of an average of 5s. a ton in the pithead price of British coal has been announced, effective Dec. 31. Of the increase, 3s. 4d. is attributable to the added cost of producing coal as a result of the recent agreement with miners for increased wages and holiday pay. The extra 1s. 10d. is necessary to meet heavy increases in the cost of timber and other materials for maintaining and increasing the output of the mines, the National Coal Board said.



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#### And For Your Information . . .

Island Creek Coal Co., in a preliminary statement issued Jan. 22, reported its 1951 coal output as more than 7.703, 000 tons, the highest in the history of the company and 1,539,000 tons more than 1950. Net profit for 1951 was estimated at \$5,650,000, or \$4.63 per share of common stock, as compared wih \$5,081,140, or \$4.15 a share, in 1950.

Twelve of the 24 mines closed in Northern West Virginia because their operators were delinquent in making payments to the UMWA Welfare and Retirement Fund have resumed operation it was reported late in December, after payments were made or arranged for on an installment basis. All the mines are small operations and arrangements for the resumption of work at the others were expected to be completed soon.

A new approach to strip restoration was indicated Jan, 7 when it was reported that the International Harvester Co. had leased some 7,600 acres of stripped land near Joliet, III., from the Northern Illinois Coal Corp. International Harvester will undertake restoration of the land to its original condition while using it as an area for testing of tractors and other heavy equipment and for the training of personnel in testing and operations.

The Safety Division of the National Coal Association is again this year planning to issue certificates to mine officials who have supervised employees for 1 yr or more without a lost-time accident. It is distributing report forms to mining companies and expects to compile the reports and issue certificates around Feb. 15. Later, a decision will be made on special recognition for officials who have supervised employees for 5 yr or more without a lost-time injury.

Steel-mill capacity, at an average operating rate of 100%, was 108,587,670 tons annually on Jan. 1, the American Iron & Steel Institute reported last month. This represents a gain of 4,358,020 tons of capacity over last year,

Joy Mfg. Co. announced Jan. 17 that it will enter the accessory field to produce parts now supplied by other companies. "This may lead to the addition of some new items to our manufacturing schedules or even to occasional acquisition of other enterprises," J. D. A. Morrow, Joy president, told stockholders at the annual meeting. Net earnings for the quarter ending Dec. 31, 1951, were \$1,276,805, or \$1.45 a share, compared with \$1,186,150, or \$1.34 a share, in the same quarter of 1950, it was reported.

A portable coal-fired crop drier mounted on a 2-wheel rubber-tired trailer is one of the recent developments of Bituminous Coal Research, Inc. Field tests indicate a low operating cost, BCR said, with a typical test showing a cost of 3½e a bushel for drying corn. The stoker-fired unit will develop up to 13,000 cfm of heated air.

TEMPLETON, KENLY & COMPANY

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#### **Anthrocite Conference** At Lehigh, May 8-9

New markets for anthracite and the role it can play in national defense will be themes of the 10th annual Anthracite Conference at Packard Laboratory on the campus of Lehigh University, Bethlehem, Pa., May 8-9, according to an announcement by F. W. Earnest Jr., president, Anthracite Institute, Wilkes-

Dr. Robert T. Gallagher, head of the department of mining engineering. Lehigh University, is chairman of the conference committee, and R. C. Johnson. vice president. Anthracite Institute, is vice chairman.

The aim of the conference is to update engineers, educators, operators, retail dealers and the general public on technological progress in the anthracite industry. Speakers will cover the most recent theoretical and practical developments in distribution, utilization and the economic and hygienic aspects of anthracite.

The committee assisting Dr. Gallagher in planning the conference includes: Paul A. Mulcey, director, Anthracite Institute Laboratory, Wilkes-Barre; J. M. Crosby, assistant to the president, and J. D. Jillson, secretary, Anthracite Institute; C. M. McHeffey, sales representative, and John F. Mears, manager of dealer service, The Hudson Coal Co., Scranton; Wilmon Kaiser, mechanical and electrical engineer, Pennsylvania Coal Co., Scran-



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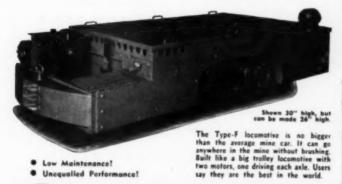
without sacrificing ductility. You can actually bend a wire of this cloth around its own diameter without fracture.

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5/8" rod in aquare and rectangular openings, flat top and non-blind weaves. Also in Gyraloy (spring steel) stainless steel, Monel metal, brass or enamel coated in any standard diameter of wire. Robins Conveyors Division, 270 Passaic Ave., Passaic, N. J.



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Also included are: Professor L. V. Bewley, head of the department of electrical engineering, and C. J. Morawec, news editor, Lehigh University; C. G. Schantz, fuel engineer, Weston Dodson Co., Bethlehem; J. R. Ray, Fritch Coal Co., Bethlehem; and Allen J. Johnson, fuels and combustion consultant, Lansdowne, Pa.

Other industry representatives on the committee are: Miss Lillian Cohen, advertising manager, Lehigh Navigation Coal Co., Philadelphia; Miss Viola Schlacks, advertising manager, Philadelphia & Reading Coal & Iron Co., Philadelphia; A. O. Glance, Allentown; and G. H. Israel, service manager, Lehigh Navigation Coal Co., Philadelphia.

L. N. Burnside, manager, equipment division, Delaware, Lackawanna & Western Coal Co., New York; C. A. Garner, vice president, Jeddo-Highland Coal Co., Jeddo; C. A. Gibbons, vice president, Susquehanna Collieries division, M. A. Hanna Co., Nanticoke; and W. H. Lesser, Scranton, also are serving.

#### Coal Needs College Men, Woods Tells Students

Changes in mining methods and coal utilization are creating interesting and rewarding opportunities for young men, Henry C. Woods, vice chairman of the board, Sahara Coal Co., told 700 students at Lafayette College, Easton, Pa., Jan. 11. Mr. Woods spoke as chairman of the Vocational Training and Education Committee, National Coal Association. Other committee members were seated with him on the platform during his address,

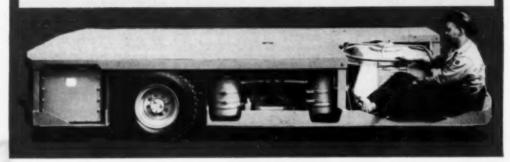
During the committee's 2-day visit to the campus, professors of the Department of Mining and Metallurgical Engineering outlined their courses of study and heard suggestions regarding modern practices at coal mines. Also, students, faculty and committee members saw a run-through of the new color film, "Powering America's Progress," recently produced by Bituminous Coal Institute and March of Time. Other subjects discussed by the committee at the meeting in Easton were the possibility of setting up a training course for coal salesmen and the need for an outline of minimum requirements for a course in coal-mine engineering.

#### Correction, Please

The editors regret the presence of an erroneous entry in Table II of the article entitled "Dual Density Cleaning," which appeared in the January, 1952, issue of Coal Age. In recalling the error to our attention, H. J. Daniels, president, H. J. Daniels, Inc., and senior author of the article, writes that in the last double column of Table II, headed "Refuse to Bank," Test No. 10 shows 1.0% coal in the material sent to the bank. This should be 0%, as in all other tests.

MANY A COAL MAN has found a helpful trick in COAL AGE'S "Operating Ideas." Let us print yours. See p. 120.

### NEW Self Propelled Portable AIR COMPRESSOR for MINING Model 275



#### This model 275 ACME AIR COMPRESSOR will operate 2-stopers and 2-Dust Collectors at once with full efficiency

#### Prominent features:

Especially designed for more efficient and lower cost roof bolting.

- 1. Exceptionally large air deliv- 5. 2 stage air cooled full ery for a portable unit. 275 cu. ft. of air at 100 lbs. discharge pressure.
- 2. Low overall height only 271/2 inches.
- 3. 6 inches ground clearance.
- 4. 151/2 ft. long 72 inches wide.
- forced feed lubrication for heavy duty operation.
- 6. 2 Extra large oil bath air cleaners especially designed to filter mine dust.
- 7. Sealed crank case.
- 8. Mechanical parking brake.

This portable type air compressor is also available in skid mounted-track or rubber non-propelled.

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# "EUCS" haul MORE TONNAGE at LESS COST

Rear-Dump Euclids of 10 to 34-ton payload capacity have a wide range of body designs...they're unmatched for efficiency on the haul road and dump... with travel speeds up to 35.7 m.p.h....powered by diesel engines of 125 to 400 h.p.

Combining rugged construction, large capacity and fast loaded travel speeds, Rear-Dump "Eucs" and Euclid Bottom-Dump Coal Haulers provide high production and low cost hauling in open pit mines. Designed to work with large loading equipment, "Eucs" are built for heavy duty off-the-highway service.



Ask your Euclid-Distributor for a cost estimate on jobs similar to yours. Euclids are your best bet for hauling coal from pit to tipple.

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These cables can take it-they have to, for backing up the big shovels is as punishing as any job a cable is called upon to perform. Continuous dragging over sharp rock, exposure to all kinds of weather, tortuous flexing, coiling - it's all in a day's work for shovel cables.

Among the six types of Hazacord shovel cables you'll find the one that best meets the requirements of your particular operation. Take, for instance, Type SH-D: Over each insulated conductor you'll find a copper shielding braid; properly grounded, it equalizes surface stresses and drains off all capacity charging currents to assure safe handling. In addition, the three grounding conductors provide an adequate low resistance ground for the equipment. Like all Hazacord shovel cables, Type SH-D has the protection of the tough Hazaprene ZBF Sheatha mold-cured, double layer of Hazaprene for added resistance to abrasion, wear and tear. Recommended for use up to 15,000 volts, Type SH-D is the safest, most used design for high-voltage applications.

For full information on Hazacord's many features that are delivering money-saving service to more and more operators . . . for performance characteristics and specifications of each of the six Hazacord shovel cables, ask your Hazard representative or write Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pennsylvania.



Embound: HAZAPRENE ZBF P-104BM

Shavel Cable

AZARU



#### Among the Manufacturers

Fairmont Machinery Co., Fairmont, W. Va., has elected A. W. Rich vice president of operations. R. M. Fisher, superintendent of construction, has been appointed contract control engineer, with headquarters at Fairmont. W. L. Doolittle, Jr., assistant superintendent of construction, has been named to succeed Mr. Fisher.

Goodman Mfg. Co., Chicago, has appointed J. P. Sullivan district manager of its Pittsburgh sales office, replacing R. C. Beerbower, retired. A graduate mining engineer of the University of Minnesota. Mr. Sullivan brings to his new post a background of 20 yr. in coal and metal mining, including 14 yr on the Goodman sales staff, most recently in the Pittsburgh field. Mr. Beerbower has represented Goodman in the Pittsburgh area since 1923 and prior to that earned wide recognition on the operating side of coal mining. Also announced the appointments of Paul Johnson and Charles Hoyt as sales engineers on the staff of the company's Pittsburgh office. Mr. Johnson will make his headquarters at Fairmont, W. Va., while Mr. Hoyt will center his activities in

the Ohio field. Both men received degrees in mining engineering at the Colorado School of Mines.

Wilmot Engineering Co., Hazleton, Pa., has announced the acquisition of the Daniels-Roller Heavy-Density process, a product of H. J. Daniels & Co., Hazleton. The association of the two companies was jointly announced by their presidents. George L. Wilmot and Herman J. Daniels. Mr. Daniels, whose company developed the Daniels-Roller Heavy-Density process (Coal Age, January, p. 90), has established his designing offices in the Markle Bank Bldg., Hazleton. where he will head up the activities of the new Heavy-Density Div. of the Wilmot Engineering Co.

Sheldon Jones, of Ebensburg, Pa., has joined The Crichton Co. (Equipment Div.), Johnstown, Pa., as chief sales engineer. A mining engineering graduate of Penn State College, Mr. Jones worked in Pennsylvania mines for 6 yr, in various supervisory posts, later serving duPont as an explosives demonstrator for 3 yr. For the past 6 yr he has been associated with the Socony Vacuum Oil Co. as an industrial sales engineer.

Hewitt-Robins, Inc., New York, has announced the formation of a new South Central sales division, with L. C. Holloman as assistant division manager in charge. The newly created division, which covers Texas, West Tennessee, Oklahoma, Arkansas, Louisiana, Mississippi and Alabama, will have head-

## PORTABLE COAL PREPARATION UNITS



(Patent Pending)

• Comprised of hopper, feeder, screen, picking table and single roll crusher. Capacity—125 or 150 tons per hour. Large heavy-duty Timken double-row roller bearings in the eccentrics and pillow blocks. Over-size Torrington spherical roller bearings in the crusher. The crushers are adjustable from 34" to 10" opening. Screened coal over the picking table is diverted by a flap-gate to the crusher or mixed with the slack for mine-run. The screen has a snappy action, resulting in efficient screening.

The picking table has a smooth motion which allows selective picking of the impurities which are disposed of in the trough running over the center of the picking table.

The unit is equipped with magnetic starters and push-button controls, 10 to 15 MP motor on the crusher, 5 MP motor on the screen and picking table. It can be readily transported from one location to another on a standard long-wheelbase truck, with minimum cost for moving and erecting.

When used in conjunction with a belt or chain conveyor, the unit can be adapted to various arrangements for handling the coal from the trucks or mine cars, through the cleaning unit, to the railroad cars or bins.

The use of oversized anti-friction bearings throughout these two unit sizes insures trouble-free operation, with low power and maintenance costs.

Full information upon request.

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## FEATURES you want in a hand-held drill!

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This new coal drill with its outstanding performance can cut your costs. Available for ½" hex or quarter-octagon collared shanks 3½" long. Write for full details today.

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Plants: Milwaukee \* Cleveland \* Greenwich, Ohio



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For further information, write The Ruberoid Co., 500 Fifth Avenue, New York 18, N. Y.

#### The RUBEROID Co.

ASPHALT AND ASBESTOS BUILDING MATERIALS

#### COAL MEN ON THE JOB





OHIO AND WYOMING: Isaac Smith (left), president, The Newport Coal Co., at his strip pit near Robertsville. Ohio; and Lawrence Welsh, superintendent, Reliance mine of the Union Pacific Coal Co., third-time winner of the Sentinels of Safety Trophy.

quarters at Houston, Texas. Mr. Holloman joined Hewitt-Robins in 1939 and formerly was manager of sales service in the Hewitt Rubber Div. Norma M. Godtrey, formerly manager of vibrating equipment sales and development, has been named manager of the Eastern sales division. Mr. Godfrey will supervise sales of Hewitt Rubber and Robins Conveyor Div, in the Boston, New York, Philadelphia, Pittsburgh and Charleston districts. Also announced was the appointment of G. V. Migula as manager of the Western sales division, with headquarters at San Francisco, replacing J. H. Hayden, who is retiring but will continue to act in an advisory capacity. Hewitt-Robins will take over the assets of Migula & Co., which has been its West Coast agents for several years. Marion D. Austin, formerly manager of hose sales and development in Buffalo. has joined the Western sales division as district manager of the Hewitt Rubber Div. He is succeeded by K. L. Way, who has been in H-R's product sales for 23

Baker-Raulang Co., Cleveland, has elected G. B. Davis vice president in charge of sales, replacing John R. Morrill, who recently resigned. Mr. Davis a veteran of 17 yr with the company, has been sales manager since 1948.

Donald C. Hansen has been named district sales representative, for Ohio, Michigan and Western New York, for the Woven Wire Fabrics Div., John A. Roebling's Sons Co., Trenton, N. J.

Gene Thomas has been appointed district representative of The Frank G. Hough, Co., Libertyville, Ill., covering the states of Washington, Oregon, Idaho, Montana and Wyoming. Mr. Thomas has been with Hough for 18 mo training for his new duties and is an engineering graduate of the University of Illinois.

The Railway & Industrial Engineering

Case History No. 5011-27

USER: Thomasville Stone and Lime

Company, Thomasville, Pennsylvania

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Diesels power Joy Heavyweight Champion blast hole drill; 3-71 for

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PERFORMANCE: Replaced 5 small drills, Maximum footage with previous

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per hour (both engines).



## This Diesel replaces five drills



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is now proving itself in
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The efficient Nolan Porta-Feeder
eliminates all delays common to
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to pull out—no man required to
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The Porta-Feeder mounts between the rails on top of the track ties, secured by jacks that permit quick movability. Little or no excavation or preliminary founda-

mean many lost tons per shift.

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Strong, massive construction. No repet or cables. Shortshaft delivery of power. Quick morability of entire unit.

drive head allows operation in water up to the base of the rails. Reciprocating pushing dogs deliver constant forward feeding motion.

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MODEL	H. P.	BRAW BAR PULL	SPEER	WEIGHT
NL5N	5	6000	25 F.P.M.	5700
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NETON	10	9000	35 F.P.M.	4300
NL15N	15	13000	35 F.F.M.	6750

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Oll-tight, non-leak transmission. Use regular auto all; change every 6



Extra-long journel spring: essure better trackability large mater, to assure more hersepower per ten weight of lacemative. Can be equipped with

#### **GREENSBURG "RANGER"**

This locomotive being used for main line haulage at the Blacksmith Coal Company, Nevinger, Missouri. This is a 4½ ton locomotive, operating on 30° gauge track. This locomotive built from 3½ to 10 tons – either single or double motor drive – 16° to 54½ track gauge.

All Greensburg Locomotives are CUSTOM-BUILT to your requirements

THE GREENSBURG MACHINE CO. 101 STANTON ST. GREENSBURG, PA.

Co., wholly owned subsidiary of I-T-E. Circuit Breaker Co., has ceased doing business as a separate company and in the future will be known as the "R&IE Equipment Div. of I-T-E Circuit Breaker Co.," continuing all its present operations in Greensburg, Pa. K. S. Nevin has been elected a vice president of I-T-E and manager of the R&IE Equipment Div. W. M. McCauley and G. L. Carlisle have been elected the vice president and commercial vice president, respectively, of I-T-E.

John A. Hartzell has been promoted to sales manager, Engineering and Construction Div., Koppers Co., Inc., succeeding Ward L. Gable, who has retired but will remain with Koppers as a special sales consultant. Mr. Hartzell joined Koppers as a draftsman in 1922 and was previously assistant sales manager of the division. Also announced were the appointments of C. W. Mohme as assistant to the production manager; C. K. Waibel, sales engineer; and C. E. Mielke and H. A. Grosick, contract engineers.

H. H. Hanft has been named assistant to the manager of the industrial department, Westinghouse Electric Corp., Pittsburgh. Formerly a section manager of the transportation sales department, Mr. Hanft originally joined Westinghouse on graduation from the University of Minnesota in 1925.

L. J. Carson, former general manager of Link-Belt Co.'s Minneapolis plant, has resigned as price executive, Machinery Branch of the Industrial Materials and Manufactured Goods Div. of OPS, Washington, D. C., and has been named general manager of Link-Belt's new Colmar. Pa., plant, which is now under construction and is scheduled to be in operation during the last quarter of 1952. Appointment of Dr. Lauriston C. Marshall as director of Link-Belt's new Physical Testing and Research Laboratory at Indianapolis also has been announced. As director of the new laboratory, Dr. Marshall will be responsible for an extensive program of original research, as well as for continuing investigation into ways and means of improving production methods and the quality of conveyor and power trans-mission products. Dr. Marshall has been Professor of Electrical Engineering at the University of California (Berkeley) and has long been active in nuclear and other research on government and university projects.

James P. Bacon has been appointed manager of sales, tubing specialties division, National Tube Co., U. S. Steel subsidiary, replacing Harry Bialock, Mr. Bacon, who joined the company in 1939, formerly was district representative division in New York.

Trackson Co., Milwaukee, a producer of tractor-mounted machines, has become a wholly owned subsidiary of the Caterpillar Tractor Co. through an exchange of stock. Louis B. Neumiller, president of Caterpillar, is chairman of a reconstituted Trackson board of directors, which will include Walter H. Stiemke,

## RECIPE FOR CLEAN COAL



Photographed on the lob. East Bernstadt, Kentucky.

#### Operators Getting Top Market Prices With Dependable Seco Screening Equipment

If you think that you need invest a fortune for equipment to turn your R. O. M. into clean coal in the wanted sizes, read this on-the-job report. In the photograph above, the Seco scalping screen located at the top of the loading ramp is removing lump coal from 95 to 100 T. P. H. of mine run, and making another size as required which goes in to the second bin. In the second circle is another Seco sizing screen taking the thru's from the bottom deck of the scalping screen. This Seco removes the slack to produce a third size of clean, properly graded coal into the end bin.

Mr. John B. Gordon, owner of the Gordon Coal Company, is enthusiastic about the hour after hour, year after year performance of their Seco vibrating screens. Their low original cost and low upkeep make it possible to screen coal for pennies per ton.

Plan now to get your share of the better profit market . . . the market for clean, properly sized coal. Send for Seco Coal Bulletin #41.



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"Blue Demons" surpass all similar bits in drilling exceptional footage and holding gauge size in harder formations . . . because of superior design and manufacture from drop forged alloy steel faced with diamond-like tungsten carbide, heat treated for toughness. Each bit finger cuts only a small part of the hole and takes only a small part of the load.

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Use "Blue Demon" Rock Cutter Bits, with replaceable blades, in sizes from 1°s" to 10°, for COAL, OIL and MINERALS EXPLORATION . . TESTING and CORING . . WATER WELLS . GROUTING . . and FOUNDATION testing.

Drillers the world over are drilling faster, with fewer bit changes, at reduced drilling costs, with long lasting Hawthorne "Blue Demon" Bits

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The new improved Flexipipe is efficient, serviceable and economical. It's made in a variety of diameters and lengths and with various accessories to take care of your individual requirements. Write us for complete information and sample.

#### COAL MEN ON THE JOB



GRAYSON BLOCK MINING CO., Grayson, Ky.: Kelley Deaton (left), superintendent: and Leo Clevenger, mine forements.

Trackson president; and the following Caterpillar officials: William Blackie, Ralph M. Monk and J. R. Munro. Mr. Stiemke and L. E. Dauer, Trackson vice president, will continue in their present administrative capacities. Trackson's two Milwaukee plants occupy approximately 150,000 sq ft of manufacturing and office space and employ approximately 440 people. Trackson products have been sold through Caterpillar dealers for the past 15 yr.

Charles B. Cushwa, Jr., has been elected president, Commercial Shearing & Stamping Co., Youngstown, Ohio, succeeding his father, who died Dec. 8. Herbert B. Wollison, vice president of the company's subsidiary, Commercial Shearing & Stamping, Inc., was elected vice president of the parent company as well. Thomas L. White has been apconsulting engineer for the company. Mr. White has recently returned from Europe where his advisory services were required on problems in the mining of coal and sulphur.

Pierce J. Fleming, manager of Mack Motor Truck Corp.'s Off-Highway Sales Div. since 1949, has been elected a vice president of the company. A pioneer in the truck sales field, Mr. Fleming joined Mack in 1918 and previously had served as Mack district manager in Buffalo, Cincinnati and St. Paul.

George L. Chedsey has resigned as supervisor of mining equipment sales, Syntron Co., Homer City, Pa., to join the Marshall Equipment Co., Huntington, W. Va.

H. M. Sossaman has been elected vice president in charge of commercial development, Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia. Mr. Sossaman, who has been with Quaker Rubber for more than 23 yr., has been succeeded as general sales manager of the company by J. R. Lewis, formerly assistant general sales manager.



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NEOPRENE air cures quickly at mine temperatures.

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Brush on your pulley "lagging" NEOPRENE Skidproof Coating.

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These continuous slot screens are unequalled for a wide range of screening and dewatering operations. For heavy media, they are used as chute bottoms for dewatering and media recovery; for drum and wheel sections; on vibrators. For jigs and other wash box types, they are used for jig bottoms; and for dewatering and wet screening on shakers, vibrators, and stationary equipment.

For separating cones, with or without sand, they are used for recovery of sand and surplus moisture; for dewatering and wet screening. For chloride washers, they are used for circulating, drain and refuse boards; for drainage, recovery of chloride and screening.

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This car spotter with its ease of installation and record of increased tonnage at inside loading points is also proving very desirable for permanent installations where its LOW INSTALLED COST and FREEDOM FROM MAINTENANCE are unequalled.

May we discuss its application to your needs.

THE W. R. STAMLER CO.

T. R. Farley and William L. Naumann have been named to direct expansion of facilities and operations of the Caterpillar Tractor Co., at Joliet, Ill., and York, Pa. Mr. Farley, a vice president, will go to York early this year to establish a temporary office as construction of the 360,000-sq. ft. plant gets under way. Production will center around replacement parts for "Caterpillar" products. Mr. Naumann, assistant general factory manager at Peoria, succeeds Mr. Farley as general manager of the earthmoving equipment plant at Joliet. Expansion plans at Joliet call for 75% increase from the present 662,400 sq. ft. of manufacturing area.

Joseph H. Humberstone has been elected a vice president of Air Reduction Co., Inc., New York. He was formerly the president of the company's Airco Equipment Mfg. Div. and has been succeeded in that capacity by Scott D. Baumer.

Frank J. Crawford, blockman of the Allis-Chalmers, Omaha, Neb., branch office, has been appointed assistant branch manager of the company's Billings, Mont., branch.

C. S. Jones has been appointed district representative for General Electric's Construction Materials Div. Mr. Jones has been assigned to the North Central district and will be responsible for wiring device and accessory equipment products, with headquarters in Chicago.

The Flexrock Co., Philadelphia, has appointed Hinds & Associates, Inc., Kansas City, Mo., exclusive representative in the states of Kansas. Nebraska, Oklahoma, Arkansas and Western Missouri, for its mechanical rod packing and building maintenance divisions.

Koppers Co., Inc., will embark on an enlarged and more unified program of research, with a major portion of such work centered at Verona, Pa., where new laboratories are now nearing completion, Gen. Brehon Somerval, company president has announced. Dr. G. F. D'Alelio, vice president and manager of Koppers research department, said: "Within a few months, a major portion of our research will be centered at Verona, and by 1953 we may have nearly 200 chemists, physicists, engineers and technicians working there. Considerable new equipment is being installed in the laboratories and they will be modern in every way." Dr. they will be modern in every way." D'Alelio explained that the new Verona center not only will provide enlarged and improved laboratory facilities but is designed to permit extensive pilot-plant work to be carried on in chemicals, fuels and the testing and improving of large machinery. One such plant now planned will make gasoline and oil from coal by hydrogenation. Dr. D'Alelio also said that the new facilities will enable Koppers to probe more broadly in the fields of coal chemicals, plastics, resins, wood preserving and metal products and also to determine new fields of endeavor.

The Gould Industrial Battery Div., Trenton 7, N. J., is producing a 1-hr-long Broadway-type show which will tour get the inside story

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Exclusive! Heaving and spreading action just the way you want it . . . slow . . . efficient! That's because every grain of King's Red Crown patented granular structure contains a balanced explosive composition. Red Crown is the most effective, most efficient form of controlled-power ever provided in Class A permissibles.

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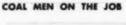
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THE KING POWDER CO., INC





MOORE BRANCH COAL CO., Hitchens, Ky.: George Stephens (left). owner; and C. C. Sexton, supt.

large industrial cities early in 1952. The review, entitled "Gould Nuggets of 1952." comprises a series of entertaining carnival acts explaining Gould's new "Plus Performance Plan," designed to help users get maximum capacity from batteries and extend their life. Invitations are available from district offices for those concerned with the care and maintenance of industrial storage batteries and equipment operated by batteries. The Plus Performance Plan comprises a library of information on how to select. charge and handle, maintain, and determine the condition of industrial storage batteries and is available free to industrial battery users.

An expansion program to increase its capacity by 20% has been announced by the Weir Kilby Corp., Birmingham, Ala., affiliate of the Taylor-Wharton Iron & Steel Co. It will utilize about 7.000 tons of steel a year when completed.

Whitney Chain Co., Hartford, Conn., is completing construction of a new modern one-story addition to its main plant that will add 10,000 sq ft to its manufacturing facilities. The program is dictated by the large demand for company products which is taxing available capacity, W. H. Whitney, president. reported.

A new trade organization of national scope, to be known as the Association of Bearing Specialists, has been incorporated with a nation-wide membership of concerns whose primary purpose is supplying ball and roller bearings to the industrial trade for maintenance. William F. Chase, president, Bearing Service Co., Pittsburgh, has been named chairman of the board for the new association. Other officers elected were: J. R. Gelomb, president, Iowa Bearing Co., president; Gene Tappero, president, Michigan Bearing Co., vice president; W. S. Mc-Clendon, general manager, Behrings Bearing Service, Inc., secretary; Harold E. Johnson, president, General Bearings Co., treasurer





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Whether you are drilling in a soft, medium, or hard roof . . . there's a FIRTHITE Mining Bit that will do the job better, faster, and cheaper. Famous Blue Bits operate efficiently in shale, slate, stratified sandstone, and limestone structures. They turn the really tough jobs into routine drilling operations. That's why, like many cost-conscious mining superintendents, you'll discover it's easy to straighten out roof drilling problems with these straight-drilling, ruggedly constructed FIRTHITE Famous Blue Bits.

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Companion to the famous Wilfley Acid Pump

Part of a shipment of 5-inch Wiltley Model "K" Sand Pumps engineered for the flotation circuit of a large South American Copper Concentrator.

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The new Model "K" Wilfley Sand Pump has won the approval of engineers throughout the world because of its dependable, trouble-free performance.

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Flood City CAR SPOTTING HOIST

The Flood City Car Spot Hoist features a quiet, self-ciling worm gear reducer rated at 6000# rope pull at 35 ft./min. INHERENTLY NON-REVERSIBLE DRIVE holds drum stationary when motor is stopped. ANY STD. MAKE OF MOTOR IS USABLE Shirtly jaw clutch frees the drum for coupling the trip.

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#### **New Books for Coal Men**

#### Saftey With Circuit Breakers

Minimizing Fire Hazards in Coal Mines by Proper Circuit-Breaker Protection of 250/275-Volt Current Systems, by F. J. Gallagher. Here's a guide based on studies in four mines, showing how to install adequate circuit-breaker protection on DC systems. It tells about the real functions, the limitations and the operation of circuit breakers in simple language. USBM, I. C. 7624. 11 pp. 8x10%-in.; paper; fre. Publications Dis-tribution Section, 4800 Forbes St., Pittsburgh 30. Pa.

#### **Progress in Briquetting**

Proceedings of a Coal Briquetting Conference, 1951. Here are 12 papers, followed by open-forum discussion, about processing and marketing briquets in this country and abroad, with descriptions of available machinery. University of Wuoming, Natural Resources Research Institute, Laramie, Wyo., I. C. No. 5. 101 pp. 8½x11-in.; paper; mimeo. \$1.

#### **Less Acid Mine Drainage**

Acid-Mine-Drainage Problems, Anthracite Region of Pennsylvania, by S. H. Ash. E. W. Felegy, D. O. Kennedy and P. S. Miller. You can do little or nothing to change the initial pH of acid mine water but concrete-lined tunnels, properly designed and lined, together with auxiliary central pumping installations, show promise of reducing acid mine water, cutting drainage costs and saving anthracite reserves. In fact, delivery of acid mine water to a central collecting point may provide water for industrial and other uses if its chemical quality can be improved. USBM Bulletin 508 72 pp. 8 x 10%-in.; paper, 60c, Supt. of Documents, Government Printing Office. Washington 25, D. C.

#### **Better Metalizing**

Metalizing Handbook. Here are helpful techniques, gathered together in a new handbook and plentifully illustrated with diagrams and photographs, showing how to prepare the surface of materials you want to metalize and how to get the most out of metalizing in machineelement work, corrosion work and many specialized production jobs. You'll find out how to repair blow-holes in castings, how to braze and solder and how to use metalizing for electrical circuits and model work. 250 pp., cloth, \$3, Metalizing Engineering Co., Inc., 38-14 30th St., Long Island City 1, N. Y.

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Weld Design, by H. D. Churchill and J. B. Austin. This is an easy-to-under-stand analysis of all the latest methods in modern metal fabricating, backed up

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Write The Editor, COAL AGE.



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by over 400 illustrations. This book will show you the advantages and limitations of various methods of weld design and application and will help you choose the materials and methods that will do the best job at lowest cost. 216 pp.; cloth. \$6.65, Educational Book Div., Prentice-Hall, Inc., New York 11, N. Y.

#### **Getting Ahead in Business**

Incentive Management, by James F. Lincoln. The big spur to developing better skills, building teamwork and making better products is recognition of skill. In his new book, Mr. Lincoln, president of the world's largest maker of arc-welding equipment, tells how this incentive can be put to work in our business life, with benefits to everybody. 288 pp.; cloth. 31, The Lincoln Electric Co., Cleveland 17, Ohio.

#### Fresh Air for Coal Mines

Some Practical Aspects of Coal Mine Ventilation, by R. T. Artz. Here's the latest down-to-earth advice from the USBM on fans, alarm signals, quality and quantity of air, ventilating systems, artificial resistance in airways, distribution and control of air currents, section ventilation, safety-code standards and related practical subjects. 45 pp. 55¢, Supt. of Documents, Government Printing Office. Washington, 25, D. C.

#### Other Books and Booklets

Annual Report of Research and Technologic Work on Coal, Fiscal Year 1950, by A. C. Fieldner and Sidney Gottley. U. S. Bureau of Mines. I.C. 7618. Free. Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

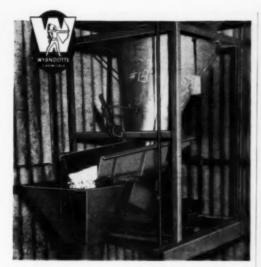
Expansion Behavior of Coal During Cerbonization, by O. P. Brysch and W. E. B. II. IGA Research Bulletin No. 11. 60 pp. 8½x11-in; paper, 85, Institute of Gas Technology, Technology Center, Chicago 16, III.

Proceedings of Conference on the Origin and Constitution of Coal, which was held June 21 to 23, 1950, at Crystal Cliffs, Nova Scotia, contains formal papers and discussions covering nomenclature, classification, paleobotany, occurrence and analysis of coal. 159 pp., 6½ x 10-in; paper. No price quoted. Nova Scotia Research Foundation, Halifax, N. S.

#### CMIA Looks to the Future Begins on p 140

ment capital and achieving a more reasonable relationship, pricewise, with all other commodities, the long view shows a brighter future, Mr. Shoemaker said in his president's address. Safety shows marked improvement, underground production per man day has increased 30% since 1935, and a sound approach to better labor management relations has been made, Mr. Shoemaker declared.

In highlighting the progressiveness of the industry, Mr. Shoemaker reported that coal represents an estimated investment of \$4½ billion, of which \$1½ bil-



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Satisfy dealers—save their time and labor . . . prevent freezing, dust, and degradation with Wyandotte Calcium Chloride!

HOW: (1) Apply with vibratory feeder or other mechanical means, at any convenient point prior to loading; or (2) apply manually with shovel to hopper car bottom, and sides as filled, plus a coating on top of coal.

Temperature Degrees F.	Pounds Flake Calcium Chloride Per Ton of Coal			
	Se Surface Moisture	Moisture	9 Surface Moisture	
+ 92 to + 15 + 15 to 0 0 to - 15	3.0 to 4.5 4.5 to 6.0 6.0 to 7.5	6.0 to 8.0 9.0 to 12.0 12.0 to 15.0	9.0 to 13.3 13.5 to 18.0 18.0 to 22.5	

Note: As the proportion of fine coal in the shipment increases, use the larger amount indicated in the table for the conditions stated.

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by men working in low coal. A new Protective Pad for greater comfort and longer wear, offering these construction features:
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How deep is the overburden?

Why guess when these low-cost, easy to operate Acker LD Core Drills tell you Quickly!

Easily! Inexpensively!

- 1. Quality of Coal 2. Thickness of Seam 3. Depth of Overburden



Model LD powered with a 12HP motor for depths to 300'.



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lion has been put in since the end of World War II. Most of this recent investment is for plant and equipment and not coal lands.

In view of our rapidly growing population and the accelerating demand for energy, some claim that a billion tons of coal per year may be required 25 yr hence and the industry must be ready to satisfy any such demands, Mr. Shoemaker concluded.

In support of safety contests as an accident-prevention measure, Mr. Maize said: "We are not primarily interested in developing championship first-aid teams, but we believe championship teams help to create interest in first-aid activity. The history of first aid in American mining, from its founding at Jermyn, Pa., by Dr. Matthew J. Shields in the 1890's to the present time, was outlined by Mr. Maize, who closed his remarks with the suggestion that championship teams should be broken up after contests to form two teams.

Concerning the benefits of first-aid and mine-rescue contests, Mr. Sisk pointed out that trained men are better disciplined and that records show that trained men have fewer accidents than untrained men. On the other hand, the interest of individual team members sometimes is decreased by poor or unequal judging at contests, Mr. Sisk declared in stressing the need for continually upgrading the quality of contest judging by all interested agencies.

First-aid and mine-rescue training and contests instill safety-consciousness in the minds of trainees, Mr. Williams said, and such safety consciousness usually is reflected in improved work habits and better safety records.

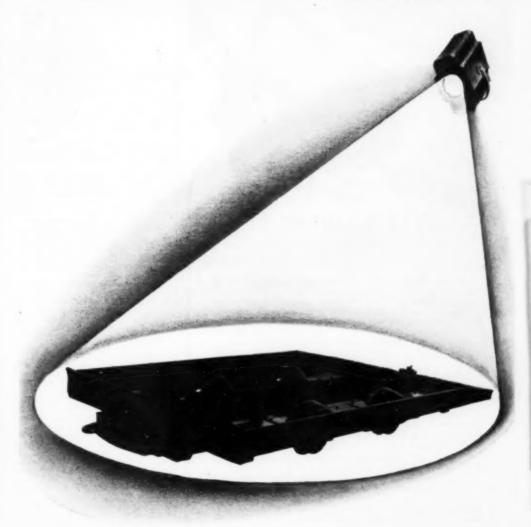
Reporting that in the 41-yr history of the Bureau of Mines 1.141.000 men have been trained in first aid and 76,000 in mine rescue, E. R. Maize declared that the mining industry firmly accepts the value of such training as a deterrent to accidents. Also, contests have sound publicity value within and beyond the industry, as indicated in the planning of Civil Defense authorities, who lean heavily toward the mining industry's trained men for aid in the event of an emergency. In summing up the viewpoint of the coal companies, Mr. Maize said that they favor well-run fairly conducted contests.

In discussion, C. F. Davis, safety director, United Mine Workers of America, Washington, D. C., concurred that safety contests have great value for the many reasons advanced by the other speakers. In addition, Mr. Davis suggested that the most revealing accident statistics are those based on frequency per million man-hours of exposure, and that continuing study of safety progress leads to the belief that no irreducible minimum exists.

Monday afternoon speakers and their subjects were: M. A. Elliott, chief, synthetic fuels research branch, Region VIII, USBM, Pittsburgh, and J. H. East, Jr., regional director, Region IV, USBM, Denver, Colo., who spoke on testing of and experience with underground diesel locomotives, respectively; and Raymond Mancha, vice president-ventilation, Joy Mfg. Co., Pittsburgh, on the correct ap-

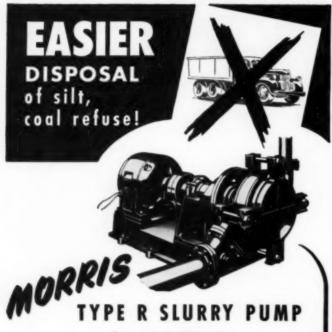


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In coal washeries and processing plants, Morris Pumps have been saving coal operators thousands of dollars in waste disposal operations. They eliminate expensive truck maintenance...trucking labor... and in many cases, they eliminate the building of roads for trucks to travel.

#### Morris pumping installation is simple in design...low in cost

Morris furnishes pumps of various types depending upon the operating conditions . . . type of refuse to be handled . . . static discharge head . . . length of pipe line through which refuse is discharged.

Morris also recommends the size of piping best suited for the job. Pipe laying expense can be kept at a minimum by using light weight abrasion resisting pipe, easily and quickly coupled . . . easily moved . . . suitable for uneven terrain.

#### REDUCE YOUR OPERATING COSTS-NOW!

Morris Pumps are ideally suited to the removal of fine silt and other types of refuse. They're easy to install . . . easy to maintain . . . easy to dismantle.

Write today for full information. Read how Morris' wide experience of 83 years in building and installing pumps and dredges can save you money and refuse disposal headaches. We'll also send you names of mines now using Morris installations.

MORRIS MACHINE WORKS

MORRIS Centrifugal Pumps

plication of multiple fans to coal mines. Mr. Keenan presided.

In summarizing Bureau tests on diesel engines in the laboratories at Pittsburgh and Bruceton, Dr. Elliott stressed the importance of operating diesel units only under recommended fuel: air ratios, in places adequately ventilated, and only when the diesel engine is properly maintained and equipped with auxiliaries such as exhaust conditioners and Bame arresters. Under these conditions, health hazards associated with the discharge of exhaust gases, explosion hazards presented by intake and exhaust openings, and fire hazards attending the handling of diesel fuel and the presence of hot engine surfaces are minimized.

On the matter of ventilation in openings where diesels operate, Dr. Elliott stated that it is difficult to make any broad generalization. Laboratory tests will show the quantity of air required to render harmless each harmful constituent in the engine's exhaust, and for coal mines, three times the quantity needed to dilute the governing constituent should be supplied, according to Bureau recommendations.

For removing aldehydes from the exhaust gases, Dr. Elliott recommended a conditioner containing aqueous sodium sulfite solution inhibited by hydroquinone to prevent oxidation of the sulfite, in preference to water-filled scrubbers.

Speaking in support of diesel locomotives in main line haulage, Mr. East declared that diesels are efficient, dependable and flexible, and that they are safe when properly maintained and operated under specified conditions.

In reviewing operating experience with diesel haulage in American noncoal mines and in foreign coal mines, Mr.
East declared that diesel power has 
proven it has definite advantages in certain applications, main haulage in particular. European records show that no 
fatalities have been charged to diesel 
exhaust effects, Mr. East said.

For conditioning exhaust gases, Mr. East recommended properly-maintained water-filled scrubbers with adequate water capacity for a full shift.

In discussion, Mr. Davis, UMWA safety director, said that he still must be sold on the over-all superiority of diesel haulage over electric haulage.

In reference to a statement by Mr. East that: "We have all observed trolley lines knocked down by a roof fall and too frequently the circuit breaker does not kick out, again making conditions right for a mine fire or explosion," D. J. Baker, ITE Circuit Breaker Co., Pitts-burgh, said that investigations of such incidents would show that circuit breaker settings were incorrect for the service.

On the subject of ventilation, Mr. Mancha said that costly bad guesses, such as sinking a field airshaft that is incapable of producing the desired results, may result if certain basic factors are disregarded. An underground altimeter survey will help identify the basic factors affecting the efficient ventilation of a particular mine.

By way of illustration, Mr. Mancha set up a hypothetical problem involving a mine that had reached a point in de-

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#### FOR BLAST HOLE DRILLING

Heavy all welded steel carriage and four individually adjustable leveling jacks make setups faster, drilling smoother. Fingertip hydraulic control permits instantaneous change of drilling feed. Bores 5 to 10-inch diameter blast holes to horizontal depths of 120 ft. or more. yeavy. Dugged

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 McCarthy Vertical Drills adapt to any job where ordinary rock formations are to be blasted.

Designed with compact retractable hydraulic tower for Truck, "Cat," Half-track or Jumbo mountings. Power shafts made of tough alloy steel. Simplified construction throughout.

Over-all height with tower reclining: 7 ft., 4 in. Wt.: 5,100 lbs. All McCarthy units can be operated with Gasoline, Diesel or Electric power units. Write for descriptive literature.



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The Multiplex chain with Rockbuster bits

## RECISION CHAINS & BITS ARE SETTING NEW RECORDS-



The Precision standard chain

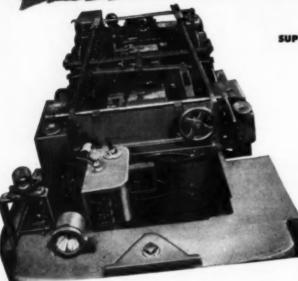
One user found 40% less power required, another found less than half the minus 1/8" fines compared with other factory type bits, and many have found Precision chains stay on the job twice as long—

There are sound mechanical reasons— new catalog tells why— write for it.

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COMPLETE REBUILDING

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The National Electric Coil Company was born in the coal mining field. Our first plant, in Bluefield, West Virginia, and our new plant in Harlan, Kentucky, are equipped and manned primarily for service to the mining industry. Key people are "graduates" of work in the mines. Either plant can handle any mine locomotive job, from continuous-weld tire tread rebuilding to complete locomotive rebuilding. Overflow coil and motor work from

either plant is done in our Columbus, Ohio plant.

Locomotives can be delivered to us via our truck or yours, or by flat car. Motors can be rewound in your shop or ours. And National electrical work is done with a full knowledge of the rugged life of electrical apparatus in mining.

If you don't know the National field engineer near you, drop us a line. He knows your problems; he's there to help you.

NATIONAL FIECTRIC COLL COMPANY

COLUMBUS 16.

YOUR COMMENTS on the mine safety program between pp 100 and 101 would be welcomed. Write The Editor, COAL AGE, 330 W. 42d St., N. Y. 36, N. Y.

velopment where changes in ventilation were required. In solving the problem, Mr. Mancha presented several alternatives to show how power requirements vary, depending on the location of the field airshaft, location of the fan and direction of the air in the field shaft.

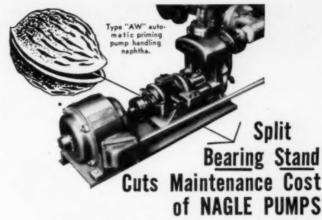
Mr. Mancha offered general conclusions, as follows:

 Usually a one-sided mine can be most effectively and economically ventilated by a single fan at the most remote field airshaft.

A multisided mine should have a fan for each side of the mine located at the most advanced airshaft.

3. Any mine should be ventilated by a centrally-located single fan until such time as field airshafts are required. Then each field shaft should be equipped with a fan when sunk, and the use of fans at intermediate shafts discontinued.

4. In all cases it is desirable to utilize, as far as possible, all entries for intake as far. Sometimes multicompartment field airshafts are justified when the available intake entries are insufficient in number or capacity. This is more often the case for multisided mines where the load on the central airshaft and radiating airshaft.



Just unscrew (or cut off with a torch if necessary) four nuts on each side and the top half of the bearing stand lifts off exposing the bearings. Merely loosen one nut on each side to release tubular supports, for slippage seal adjustment. Instant "thumb & forelinger" packing gland adjustment. Impellers, plates or casings changed in a jiffy. These and other features cut maintenance costs to the bone. That is why Nagle Pumps are preferred for the really tough pumping jobs. Also vertical shaft pumps for pumping abrasive or corrosive materials.



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Have ample resistance to start locomotives amouthly on the first point and sufficient capacity for long life. No special frame construction is necessary. Just mount the units in place and connect controller leads.

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ways is a maximum, thus resulting in excessive velocities near the foot of the downcast shaft.

Friday morning topics and speakers were: "Fire-Fighting Equipment and Facilities at Indianola Mine, Republic Steel Corp.," by G. D. Wyant, superintendent, Indianola mine, Indianola, Pa.; "Praetical Ways of Preventing Accidents in Haulage," by W. J. Schuster, safety director, Hanna Coal Co., St. Clairsville, O.; and "Market Prospects for Coal in the Future," by Joseph Pursglove Jr., vice president in charge of research and development, Pittsburgh, Pa. H. P. Greenwald, regional director, Region VIII, USBM, Pittsburgh, was chairman.

Concerning the fire-fighting equipment at Indianola, Mr. Wyant declared that the considerable initial expense for pipelines and equipment was more than justified in May, 1951, when a serious fire was quickly extinguished without major damage to the mine.

The piping system consists of 21,000 ft of 4-in pipe along main-haulage roads and into the working sections. The 4-in line is connected to the bottom of a 12-in shaft column line which takes the discharge of the main pumps to the surface. Pressure in the 4-in line is maintained either by the two 1,200 gpm pumps or as a result of the static head in the 200-ft high column line. Firehose outlets are available at regular in-tervals in the 4-in line. Each cutting cutting machine, loading machine and locomotive is equipped with a carbon-dioxide fire extinguisher. A connection at the top of the column line is available to permit the system to utilize the municipal water supply.

Also, the mine mechanics and electricians designed and built a fire truck which is equipped with tools, fire hose, brattice supplies and so on.

The fire occurred May 24, 1951, when a cable fire ruptured an hydraulic hose on a loading machine, spraying flaming oil over the discharge end of the loading machine. The hand extinguishers were effective, but then gases from the oil burst into flame. The fire truck was called and arrived at the scene about 35 min after the fire started. A fog gun, fed by the pump on the truck, was used to permit the fire-fighters to advance to within 40 ft of the fire. One hour after the water was first applied the fire was out, and Mr. Wyant credited the fire-fighting facilities with preventing high property losses and possible loss of life. On the subject of haulage-accident

On the subject of haulage-accident prevention, Mr. Schuster pointed out that one of the most practical ways to reduce the toll is to apply sound training methods, starting with foremen first, then reaching out to the men. This training is necessary even though all mechanical safeguards may be installed.

In defining the seriousness of haulage hazards, Mr. Schuster declared that if haulage-accident frequency was calculated only on the hours of exposure of haulage employees the fatality rate attributable to haulage would be three times the roof-fall rate and the lost-time-injury figure would be eight times that charged to roof falls.



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Once you've tried Du Pont "Monobel" AA in your mine you'll see why it's the world's largest selling permissible. This high-density, low-velocity permissible enables you to bring out more firm, coarse, lump coal per ton...in less time.

"Monobel" AA does an economical blasting job in high, hard-shooting seams... produces a heaving action that shears coal evenly, at the back and on the ribs. You'll like the way "Monobel" AA throws coal clear of the face where mechanical loaders can easily get at it.

The excellent water resistance of "Monobel" AA makes it ideal for top or bottom cutting even in the wettest mines. And, because it produces a minimum of smoke and fumes, you'll take less time away from the face . . . another moneysaving feature.

To increase lump coal production and cut costs—give "Monobel" AA a trial in your mine. For complete information on this popular permissible and other dependable blasting products, contact your Du Pont Explosives representative. He's always glad to help with your blasting problems. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware-

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BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY



Energy requirements in the United States may double in the next 25 yr, Mr. Pursglove said, and even though other sources of energy (oil, gas and water) may double their contribution to the energy market, coal may have to provide from 880 million to 1 billion tons per year to satisfy the need. To do so, the industry will have to raise efficiency, conduct extensive research in all phases and plan for the possibility.

Concerning the high cost of transportation, Mr. Pursglove reported that a 1234-in pipeline now carries 9,000 tpd a distance of 1 mi. Although only fine coal can be handled in this manner, it appears that the market is gravitating toward the use of fines.

The rising energy demand will come chiefly from increased use of electrical energy, and since all cheap power has been gobbled up by power plants along our waterways, coal will be a natural to fuel the steam plants that will be required to keep pace with the growing use of electricity, Mr. Pursglove said.

On Friday afternoon, the advantages and problems of roof-bolting were discussed by Acel Garland, director of industrial engineering, Island Creek Coal Co., Holden, W. Va.; A. R. Hood, assistant superintendent, Warwick mine, Du-quesne Light Co., Greensboro, Pa.; A. Werft, chief engineer, Frick Div., U. S. Steel Co., Uniontown, Pa.; and J. McKenna, mine inspector, Pennsylvania Department of Mines, Waynes-burg, Pa. Joseph Bierer, administrative assistant, West Viriginia Department of Mines, Charleston, W. Va., presented a paper on bolting experience in West Virginia prepared by Arch J. Alexander, chief, West Virginia Department of Mines. Concluding topic of the 2-day program was the hazards of bolting, discussed by James Westfield, chief, and F. G. Anderson, mining engineer, accident-prevention and health division, Region VIII, USBM, Pittsburgh. J. J. Snure, production manager, Rochester & Pittsburgh Coal Co., Indiana, Pa., presided.

Describing operations in the Cedar Grove and Eagle seams in West Virginia, Mr. Garland said that roof throughout the five Island Creek mines now using bolts may be classified into three general types. Type A consists of from 8 to 12 in of laminated shale topped by about 20 ft of soft sandstone and then a hard sand. Previously, two or three crossbars per cut were required to hold the roof now being held by eight bolts per cut. In rooms the bolts are inserted through 3x8-in planks. Entries are driven up to 21 ft wide and rooms up to 28 ft wide, and production under Type A roof may improve up to 25% because of the better conditions resulting from bolting.

sulting from bolting.

Type B roof is shale which contains many kettlebottoms and horsebacks. Bolts and safety props improved conditions to the point where a 12% increase in production may be expected.

Type C roof showed no apparent consolidation and was almost impossible to hold on conventional timbers. A combination of bolts and timbers now permits mining under this roof, Mr. Garland said. Roof bolting is a success, and

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You can't beat safe American Couplers for today's big cars and longer trains. Heads are husky, one-piece steel castings which enclose and protect locking parts. Buffing exerts no side pressure. It is taken by sturdy flanges, without impact on the lock. Pull is transmitted through steel-to-steel contacts—not through the lock pivot pins.

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You get extra-wide gathering range-5" axial displacement or 60° angularity, borizontally; 2%" displacement or 18° angularity, vertically. Locks grip tightly-prevent slack and costly wear. You can rotary-dump without uncoupling; unlock from either side. Get the utmost in safety and savings now! Standardize on American Automatic Mine Car Couplers.





—and they're always ready to couple, because locks pivel freely in uncoupled heads. Movement of lock-control hur remains unrestricted until flanges of two heads some legation.

#### HOW AMERICAN COUPLERS LOCK



As pivoted locks swing into engagement, each control bar drops to lock against the flange of opposite head.

#### LOCK-SET FOR UNCOUPLING



Lifting and pulling either control bor unlacks the coupler and holds lock is lock-set position until heads move apart.

# Safe...Sure AMERICAN MINE CAR COUPLERS

AMERICAN STEEL FOUNDRIES, 410 N. MICHIGAN AVE., CHICAGO 11, ILL.

safety is increased, Mr. Garland said in reporting that the five mines have produced over 9 million tons since the last fatality occurred.

At Warwick mine, where the Pittsburgh seam is being mined, safety and efficiency have been improved since the introduction of roof bolting, Mr. Hood said. Furthermore, it is expected that added bolting costs will be more than covered by savings on dead work, and snap-coal sections of the Pittsburgh seam, heretofore mined only with great difficulty, now are showing higher recovery.

Mr. Werft declared that bolting offers the greatest single opportunity for increased safety and efficiency. Bolts cannot be dislodged, offer less resistance to ventilating air, provide increased clearances and make housekeeping easier, Mr. Werft said. In fact, bolts may hold through an explosion, thus making rehabilitation easier. Mr. Werft warned that each mine should be studied before bolting is attempted to be certain that these advantages will accrue to the mine under consideration.

Mr. McKenna, a member of the Pennsylvania mine inspectors' committee appointed by the secretary of mines to
study roof-bolting, reported that operators in Pennsylvania may adopt the new
system after permission of the Department of Mines has been secured. Only
two mines have applied for such permission to date. On the advantages of
bolting, Mr. McKenna said that in particularly bad sections production may be
increased from 33 to 40% by bolting,
that better maintenance of air courses is
possible and the use of timber may be
materially reduced.

Over 1,000 mi of mine openings are or have been bolted in West Virginia, Mr. Alexander reported, and one great advantage is the fact that perhaps more than 100 men owe their lives to bolting. It is important, however, that certain standards be set up and these standards strictly followed, if the full benefits of bolting are to be realized. Mr. Alexander added that bolting could not have developed so rapidly without such rigid controls. In preparing a bolting program, select tools on the basis of the job to be done, choose crews who will install each bolt securely and safely and provide for strict supervision, Mr. Alexander advised.

Mr. Anderson listed some of the hazards of bolting, as follows:

Installation of bolts without prior consultation or experimentation.

Failure to use timbers during experiments and safety props during installation.

Working inby the last row of bolts and failure to bolt as soon as the roof is exposed.

 Failure to obtain proper anchorage, drilling oversize boreholes, failing to tighten bolts sufficiently and tightening bolts non-uniformly.

Lack of supervision and failure to control dust produced by drilling.

Noting that 71% of the mines in Region VIII employ no dust-control measures in roof-bolt drilling, Mr. Anderson advocated either wet or dry dust suppression, with dry collection preferred.



Compare-and you'll see!

These figures, comparing ASTM requirements with typical G-E Geoprene values, indicate at once the superiority of portable cable with Geoprene sheath:

ORIGINAL	ASTM Requirements	Geoprene Typical Value
Tensile strength, Ib/sq in.	1800	3000
Per cent elongation	300	500
Set in 2-in. test piece, in.	3/8	1/16
After 7 days in Geer oven at 70 C		
Tensile strength, Ib/sq in.	1600	2900
Per cent elongation	250	430
After 96 hr in oxygen bomb at 70 C		
Tensile strength, Ib/sq in.	1600	2800
Per cent elongation	250	430
After 18 hr in ail at 121 C Per cent depreciation in		
tensile strength  Per cent depreciation in	40	35
elongation	40	35
Tear Test Tensile strength, min Ib/in.	401	75

†This is the requirement for rubber jackets; no tear value has yet been set for neoprene-type jacket. General Electric Geoprene portable cable is constructed with a neoprene-based jacket. We know of no tougher, more abrasion-resistant cable jacket. It is highly resistant to oils, acids, alkalies, sunlight, and flame. Try it! Be convinced by your own first-hand experience that you'll get more miles, more hours, more tons of service from a G-E Geoprene cable.

General Electric makes a full line of wires and cables for the mining industry in addition to portable cable, including such cables as varnished-cambric insulated, Super Coronol\*, wirearmored, interlocked armor, aerial cables, Flamenol\* control wire, magnet wire, and mine telephone cable. A 24-page booklet, General Electric Wire and Cable for the Mining Industry, is yours for the asking. Section W6-214, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

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# FREE BOOK

HOW RCA D-WAY

SPEEDS OPERATIONS

STRETCHES" EQUIPMENT

. . tells in non-technical language what 2-way radio is and what it does . . shows how it works. You'll see how management can know at all times what's going on because it has voice contact with roving crews and with men at remote locations.

... shows how RCA 2-way radio expedites materials handling, coordinates survey and construction projects, and eliminates aimless driving in tracking down trouble . . . It reports how 2-way radio is used to route cars and trucks, to mobilize

repair crews fast, and to prevent disruption to production cycles.

. also covers the survey facilities offered by RCA to determine the 2-way radio system that best meets your business needs . . . includes a digest of the FCC rules regulating industrial radio service . . . reveals how to co-operate with industry's frequency allocation committees.

This brochure is yours for the asking. (In Canada, write: RCA Victor Limited, Montreal.)



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Security with Service

BENEFITS THE MINING INDUSTRY





The Bituminous slogen, "Security with Service," applies to all phases of mining operation . . . to operators and workers alike. It keynotes the Bituminous Safety Engineering program, consisting of regular mine inspections . . . analysis of mine hazards . . . survey recommendations . . . accident prevention activities . . . reduction of operating expenses resulting from accidents . . . and establishment of production effieiency. Bituminous Safety Engineers are constantly alert to the hazards that might affect Bituminous Workmen's Compensation policyholders . . . and to forestall these hazards before they take shape. Thanks to their training and skill, Bituminous' slogan is a "living" phrase, packed with meaning for the mining industry.

BITUMINOUS CASUALTY

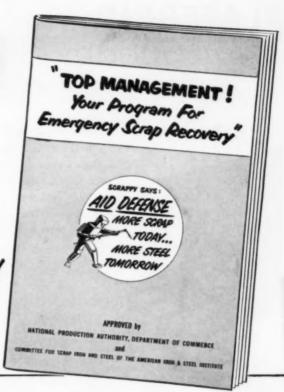


ROCK ISLAND, ILLINOIS

OVER 30 YEARS OF SERVICE TO THE MINING INDUSTRY

# What YOU can do... Must do

to ease the critical iron and steel scrap problem



It's a problem calling for the assistance of every thoughtful business man—now.
Unless the steel mills get more scrap...
furnaces may have to be shut down.

Shut down—at a time when our armed forces need more and more equipment... when civilian demands for steel are greater than ever... when our economy is fighting desperately against inflation!

You Can Help. Yes... regardless of the business you're in ... you're in the scrap business, too.

If you're in the steel-fabricating bus-

îness, you have extra dormant scrap to be added to your production scrap.

If you're in any other business, you surely have idle metal that will do you—and America—more good being fed into furnaces than cluttering up your premises.

Write for Suggestions. The booklet shown here tells how to set up a Scrap Salvage Program with least amount of effort and minimum interference with your regular operation. It tells where to look for scrap, what to do with it when you get it.

You are urged to send for the booklet

now. Use the coupon.

FACTS ABOUT SCRAP SALVAGE

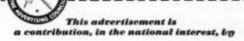
Steel production 1950 — 97,800,000 net tons Estimated capacity 1952 — 119,500,000 net tons

scrap used\* 1950 — 29,500,000 gross tons Estimated purchased scrap requirement\* 1952 — 36,200,000 gross tons

\*All consumers

Where will the extra tonnage come from? Mostly from your dormant metal obsolete machines and structures, tools, jigs, fixtures, gears, wheels, chains, track.

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## NEFF & FRY Silo at Aflex Mine for Loading and Storing Coal



s Coal Co

At the Aflex mine of Leckie Smokeless Coal Co., high-content raw feed is plowed off the conveyor belt into the Neff & Fry Silo shown in the photo. When the feed is mostly debris, the plow is raised and the refuse goes to the wooden him.

and the refuse goes to the wooden bin.

The 20' x 37½' silo has sufficient capacity to hold three hours' mine output, standby storage against delays. Coal is loaded into cars from the chute by gravity.

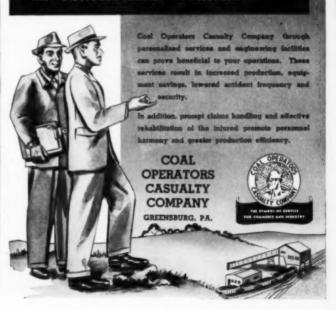
This is another of the many interesting installations we have made at coal mines. We'll be glad to tell you about them; also to study your particular problems. Write, wire, or phone us.

THE NEFF & FRY CO.

228 Elm St. Camden, Ohio

SUPER-CONCRETE STAVE NEFF & FRY

#### COAL PRODUCTION INCREASED BY PERSONALIZED SERVICE.



#### Again Outstanding DESIGN for New Speed and Economy in Drilling

OXTOORICU
MODEL 51 · SELF-PROPELLED · HYDRAULIC
COAL AND CLAY DRILL

This Model 51, oneman operated drill, adds another unit to the top performing PARMANCO line of drilling machines.

An example of its great value is seen in its ability to drill 2½-inch holes at a speed up to 7 feet per minute in No. 5 coal. It will also handle 4¼-inch augers up to 25 feet in depth.



· Hydraulic Feed · Finger-Tip Controlled · Fluid Motor for Auger Rotation







#### GUIDE

Model 51 is equipped with the newly perfected Automatic Drill-Cuttings Shield and Guide. Now blast holes are kept absolutely clean from cuttings. Note in picture how a dam is formed about the blast hole, excluding casual surface water.



Looking down on New Automatic Drill-Cuttings Shield and Gulde located at the right of driver's seat.

Send for Complete Details



4 Jacks and Power Winch optional at extra



PARIS MANUFACTURING COMPANY . PARIS, ILLINOIS



The telephone bell tolls loud and long for quarry and stripping operators whose blasting creates excessive noise and vibration. Neighbors often threaten to ring the bell for good on future operations.

Generally, it is the "air blast" (air vibration) which irritates the neighbors. By longer confinement of the explosives force of a blast, the ROCKMASTER System practically eliminates this noise . . . uses the full power of the blast to break rock.

Some operators have found that they can greatly increase the size of their blasts and at the same time end the neighbors' complaints by switching to the ROCKMASTER System. To see how you can disturb more rock without disturbing your neighbors, send for your free copy of the 20-page ROCKMASTER book today.



ATLAS POWDER COMPANY - WILMINGTON 99, DELAWARE
Offices in principal cities



Here are eight holes ready to shoot. ROCKMASTER milli-second delay detonators are at the bottom of each hole to start action on the toe. This gives maximum confinement of explosives gases and thus minimizes air blast.



This is the height of the blast. There still are no escaping gases.
The only large boulders are those few which were at top of the face and away from the twisting action of the milli-second delays. Remainder of rock is bitz-size.



The only sound heard here was a dull rumble. The toe can be seen clearly moving out first. The confined power of the explosivus plus the one-two punch of milli-second delays assures good fragmentation and controlled throw.



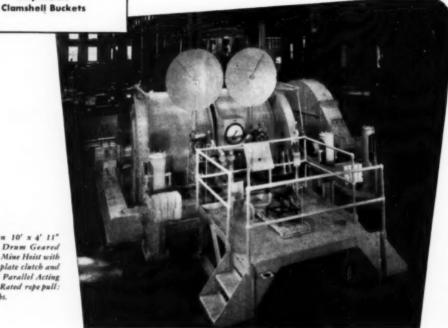
4 Here's the pile ready for the shovel. Bulk of rock is properly distributed. Face along line holes shows little or no backbreak. Another example showing that ROCKMASTER disturbs rock but not neighbors.

#### Wellman will build it

**Special Cranes** Mine Hoists Car Dumpers **Gas Producer Plants Ore Bridges Charging Machines Industrial Furnaces Gas Flue Systems Gas Reversing Valves Coke Pushers** Skip Hoists

### Wellman Electric **Mine Hoists**

Proved by performance



Wellman 10' x 4' 11" Double Drum Geared Electric Mine Hoist with 7' axial plate clutch and 10' x 13' Parallel Acting Brakes. Rated rope pull: 22,000 lbs.

• For more than half a century, in mines all over the world, Wellman Electric Mine Hoists have been used because they combine expert design with expert construction . . . featuring all the "modern improvements" developed in our 50 years' experience. Wellman Mine Hoists provide maximum safety, peak economy, and trouble-free operation under a wide variety of conditions. Let us give you recommendations for hoists that will do your job most satisfactorily.

#### THE WELLMAN ENGINEERING COMPANY

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AO Announces

"PLASTOLITE"

PLASTIC LENSES

Identical with glass in Optical Properties . . . Far Lighter in Weight

#### HERE IT IS ...

the quality eye protection in plastic lenses many safety directors have wanted . . . the answer for workers who need protection but demand lightness heretofore unobtainable . . . the answer for companies who seek the enthusiastic cooperation of all exposed employees in cutting the high costs of eye accidents.

#### Made in the World's Cleanest Rooms!

Interested in plastic for years, AO has conducted constant research both in the protective properties of this material and in the atmosphere, facilities and controls required to assure maximum quality in the manufacturing process. In a new safety plant section at Brattleboro, Vermont, where Plastolite plastic lenses are made, all foreign matter is excluded which might impair the quality. Not only are the premises dust-free, lint-free and air conditioned—the workers wear special clothing! What's more, AO Plastolite lenses undergo a multitude of tests and inspections. Result: lenses with the optical properties traditional with AO that conform to the highest known standards!

#### RECOMMENDED USES:

For workers exposed for long periods... women workers... supervisors, foremen, plant visitors. Especially desirable for electronics work and spot welding. AO Plastolite lenses provide excellent protection against impact particularly where flying particles are small and acid exposures are no problem. NOTE THE LIGHT WEIGHT OF THESE LENSES IN YOUR HANDS AND OVER YOUR EYES!

#### AVAILABLE ON YOUR FAVORITE AO GOGGLE

AO Plastolite lenses are available as 6 curve lenses in all eye sizes on your favorite AO safety goggle. Your nearest MSA Representative can supply you with this outstanding advance in eye protection.

AO's Industrial Vision Program Increases Production, Decreases Accidents. Write today for backlet "Improved Industrial Vision."



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# **Mining Industry**



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CONTINENTAL ROOF BOLT PULL TESTER IN ACTION, RUGGED PORTABLE. ACCURATE. CAPACITY 25 TONS.

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ELIMINATES
SHOCKS and BURNS
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#### AUTOMATIC TRANSFER SWITCH

SINGLE OR DOUBLE TROLLEY AND REEL



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Available in 250 to 600 Valts



P-G Automatic Transfer Switches are designed for use on all types and makes of gathering locomotives.

Automatically transfers the current from trolley to reel, or vice-versa. Hand operated switches are eliminated.

**Promotes safety**—avoid shocks or burns to operator while changing from trolley to reel.

**Simple in design**, easy to install, requires very little space, and can be mounted anywhere. Furnished complete with cover.

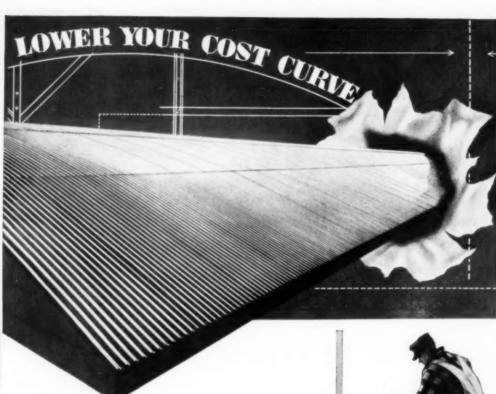
**Heavy duty coils** provide for positive contact through double contact assembly. Contacts are easily renewable.



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When S, M. Pistorio, of Arbutus, Md., needed a new roof on the curved wood trusses of his big warehouse, he found he could save on initial cost and lower his cost curve through the years with Reynolds Lifetime Aluminum Industrial Corrugated.

In this case, 11-foot sheets were used, curved at the site. For other curved roofs, Reynolds can supply curved sheets on request—minimum radius 5'. However, this special use only serves to demonstrate the versatility of aluminum industrial corrugated. On any type of roof it gives the owner the advantages of freedom from rust without protective painting, plus the radiant heat reflectivity that keeps interiors cooler in summer, warmer in winter.

The lighter weight of this roof (56 pounds per square) was especially important on this wood-trussed warehouse. On new buildings this factor can mean substantial savings on framing.

Call Reynolds for technical assistance and application details ... offices in principal cities. For literature, write to Reynolds Metals Company, Building Products Division, 2007 South Ninth Street, Louisville 1, Kentucky.

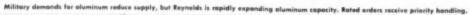


#### Specifications:

Thickness .032"
Corrugations 7/8" deep, 2-2/3" crown to crown

Uniform load support (roof) 80 p.s.f. on 4' purlin spacing Uniform wind load capacity (siding) 20

Uniform wind load copacity (siding) 20 p.s.f. on girt spacing up to 7'9" Roofing width 35", coverage 32" Lengths 3', 6', 7', 8', 9', 10', 11', 12'



# REYNOLDS Lifetime ALUMINUM INDUSTRIAL CORRUGATED

"The Kate Smith Evening Mour" on Television, Wednesdays-Tallulah Bankhead in "The Big Show" on Radio, Sundays-NBC NETWORKS



# COAL PUTS THE PLENTY IN THIS LAND OF PLENTY!

Thanks to coal, America has plenty of refrigerators, stoves, autos, even TV sets, for coal is essential in making the steel that goes into them. America gets electricity-a-plenty—thanks again to coal, which supplies our utilities with 70% of their fuel. And most of this nation's great plenty of fine products is made in factories that use bituminous coal for power!

Coal will continue to supply all the heat, light and power America needs. Of America's entire fuel reserves, 92% is coal and America's mines are the most efficient in the world!

Are you responsible for choosing a fuel to generate power in a factory—to heat a home or other building? Then think of the many advantages of *bituminous* coall

#### DOWN-TO-EARTH FACTS ABOUT COAL!

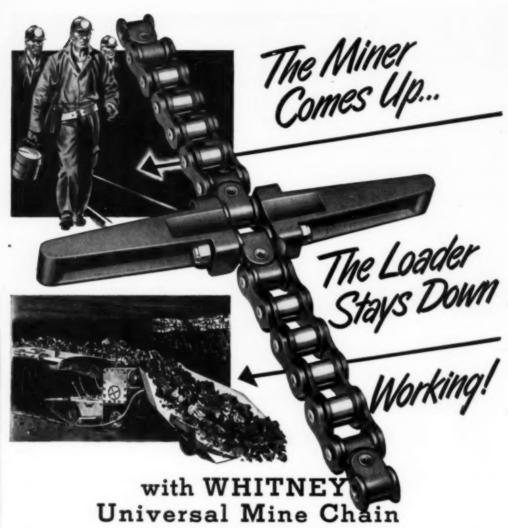
- Lowest-priced fuel almost everywhere!
- Labor costs are cut with modern boilers and automatic handling equipment!
- Easiest and safest to store of all fuels!
- America's vast reserves make coal's supply always dependable!
- ▶ Dependable supply assures price stability!
- A progressive industry strives constantly to deliver an ever better product at the lowest possible price!

#### BITUMINOUS COAL INSTITUTE

A Department of National Coal Association, Washington, D. C.

YOU CAN COUNT ON COAL!

COAL AGE . February, 1952



Here's one investment that will pay you daily profits . . . it's the new Whitney Universal Joint Mine Chain.

Shifts change — miners come up — but loaders equipped with Whitney Loader Chains stay at-the-face getting out coal. The reason — Whitney Chains are expressly engineered to stand the wear and tear of the toughest mine service. For instance, Whitney's new flight design eliminates localized stresses in flight studs. This feature reduces breakage and costly down time. Alloy steel chain parts assure longer operating life.

Whitney Loader Chains further reduce your operating costs because they permit on-the-job chain repairs if necessary. All you need is a few sections of packaged chain and flight sections, a wrench and hammer and the loader is ready to keep working in a few minutes.

Look into the new Whitney Mine Chain, today. See for yourself how this outstanding chain will lower your costs, simplify maintenance and reduce inventories. Get in touch with your local Whitney distributor — or write us for complete information on this Mine-Engineered Whitney Loader Chain.

#### WHITNEY CHAIN COMPANY

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pproximates Bronze-Retainer Precision



# **u-Roll** Roller Bearings Rollway's

Now-approach the trueness and long-life of a high-precision bearing for approximately steelcage cost. Improve power efficiency and reduce preventive maintenance over ordinary bearings... while conserving the use of critical bronze. TRU-ROL enables you to do all this with only minimum variation from top bearing performance.

That's because Tru-Rol's contoured guide lips assure precision rolling . . . prevent roller skew with its long train of evils . . . sliding friction, end rub, power loss and reduced life expectancy. More-lubrication is evenly distributed over each roller, assuring a thin oil film that reduces heating and lowers friction torque.

# Nation-wide Replacement Service

Rollway Bearings are available for replacement through authorized bearing distributors in principal cities. To locate, consult classified phone directories under BEARINGS.

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ANOTHER FIRST SINCE 1910 WITH DART

The strongest truck frame

TALK WITH DART ABOUT YOUR TRUCK PROBLEMS YOU'LL GET SPECIALIZED SERVICE



built today is yours when you buy a Darl Truck with a Bax Girder" frame. Side rails are welded box sections with extra heavy top and bottom plates. Greater torsional strength and load carrying ability means protection of all mechanical components because of permanent alignment regardless of road irregularities. No loss of time due to frame repairs.

> DART TRUCK CO. KANSAS CITY 8. MISSOURI

OVER 40 YEARS EXPERIENCE IN BUILDING SPECIALLY ENGINEERED TRUCKS

# THURMAN **PORTABLE** TRUCK SCALE

- Platform Lengths 18, 22, 24 & 30 ft.
- Capacities 20, 25 & 30 Ton



The Scale that can be moved from job to job

Special sizes made to meet special requirements

Wide Steel Bases — support scale — require no concrete footings. Easy-to-read chrome plated weighbeam with vital parts electroplated against corrosion.

Accurate and Portable — This scale can be transported from job to job by removing 6 nuts which hold side arms in place. The rest of the scale can be lifted as a unit. Once located, it can be readed for use in minutes.

THE COMPLETE THURMAN LINE INCLUDES:

- Pit Scales up to 50-ton capacity
   Pitiess Scales Batching Scales
   Liquid Weighing Scales
   Warehouse Scales
  - This and other weigning equipment in sizes to fit your requirements.

**MACHINE CO.—Scale Division** 



# America needs SCRAP!

Clean up your shop and your job...

put unused scrap to work for AMERICA!

Don't let metal scrap lie idle. It's vital to keep America's production at peak level. Steel producers need 37,000,000 ons of scrap a year to serve you and

America. Remember: today's scrap is tomorrow's production of steel for the American Way. It can also make the tanks, guns, and shells to protect our future security. In the shop... or out in the field... clean up after every job — and "Get in the Scrap!"

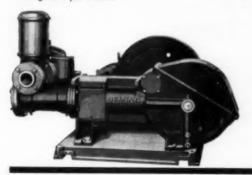


LACLEDE STEEL COMPANY

St. Louis, Mo.

# DEMING Mine PUMPS

● Deming Fig. 1896 "OIL-RITE" has a long record of dependable performance in mine gathering service. Important features of this heavy duty pump include Timken tapered roller bearings on pinion shaft; stainless steel piston rod; and pinion of high carbon steel with machine-cut, helical teeth, keyed to a shaft of extra large diameter. Fig. 1896 "OIL-RITE" Mine Gathering Pump is furnished in 5 and 6 inch stroke. Capacities range up to and including 100 gallons per minute.





Above view shows a team of Deming Vertical Turbine Pumps in dewatering service. The advantage of these pumps is that the electrical starting and operating equipment is located at surface level and therefore cannot be flooded out. A full range of capacities meet all requirements up to 3000 gallons per minute or more.

For complete details about all types of Deming Mine Pumps, send for BULLETIN 1000-A.

THE DEMING COMPANY
533 BROADWAY SALEM, OHIO



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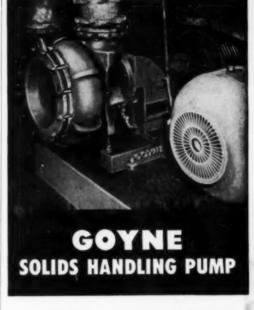
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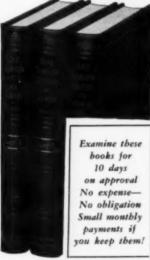
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HP	MAKE	TYPE	BPM"
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400	Cr. Wh.	CCD	200
400	West.		300
160	Cr. Wh.	CMC	1200
120	G. E.	DMC	300/750
100	West.	SK-198	676
100	Wost.	SK-1421	1700
90	West.	SK-153	#50
60	Wost.	SK-123L	1750
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180	Burke	8-79	900
180	Cr Wh.	CMC	1450
180	West.	SK-190	720
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150 KW G.E. DC 275 v., motor, 2300/4000 v.
150 KW G.E. DC 275 v., motor, 2300/4000 v.
160 KW G.E. DC 275 v., motor, 2300/400 v.
160 KW G.E. DC 275 v., motor, 2300/400 v.
160 KW G.E. DC 275 v., motor, 2300/400 v.
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